Empyre Elite XT

Model 100 and 200

Installation and Operation Instructions

PRO-FAB INDUSTRIES INC.

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The Empyre Elite XT Hot Water Furnace

You have selected one of the best wood stoves/furnaces on the market today! It has been specially designed to produce highly efficient heat with emissions well below environmental standards, and we are proud to offer a 10 year limited warranty!

To ensure maximum benefit from your new Empyre Elite XT furnace, read the Installation and Operation Instruction Manual cover to cover and follow all instructions carefully.

The Empyre Elite XT furnace has been designed for outdoor installation and has also been tested to meet UL Standard 391 - 2006/726-06 Standard C22.2 No.3 and CSA B366-1-M91 for indoor central solid fuel fired furnaces, therefore it may be installed indoors. It is ideally suited for both domestic and commercial use.

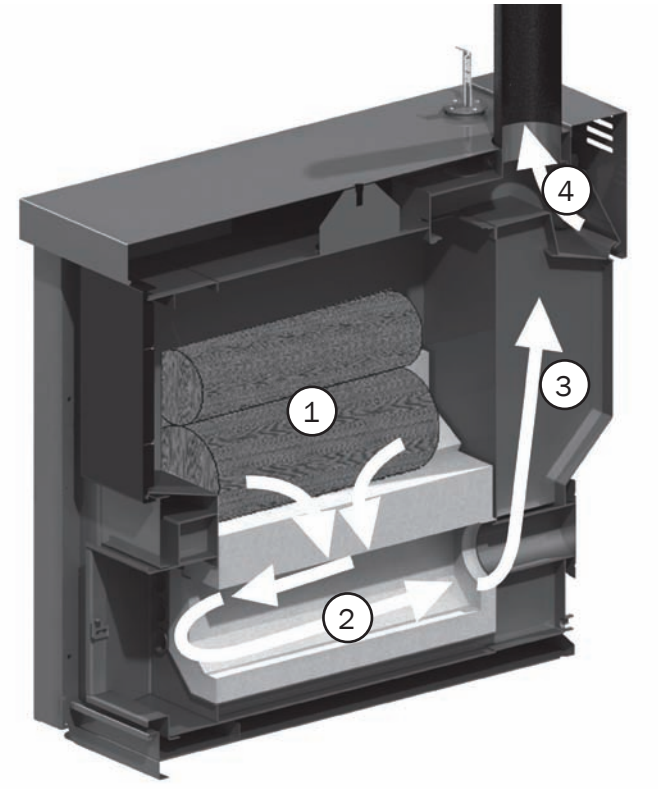
Please keep this manual for future reference.

MODEL Empyre Elite XT

How The Empyre Elite XT Works

The Empyre Elite XT uses a process called wood gasification to produce highly efficient combustion in the furnace's dual burn chambers. (1) Wood in the firebox burns from the bottom, drying the top layer of wood in the firebox and forcing gases and exhaust into the lower burn chamber. (2) In the brick-lined lower chamber, these volatile gases are burned at temperatures as high as 2000°F (1093°C).* The fire brick lining in both burn chambers absorbs the heat and maintains burn chamber temperatures for consistent gas combustion. This high-temperature gas combustion significantly lowers emissions, prevents creosote buildup, and minimizes ash buildup in the unit. (3) After passing through the burn chamber, exhaust air escapes through multiple flues running through the water jacket, heating the water quickly and efficiently. (4) The exhaust cools as it passes through the flues, and when it leaves the chimney, temperatures have fallen to 350°F (177°C).

**varies based on fuel type, burn rate and other conditions*
Read more on gasification on page 17.



Model & Serial Number Information

Locate and record the serial number in the space provided. See page 6 and 7 for location of decal on furnace.

Have this information available when contacting the dealer for service, warranty or other information.

Model No. _____

Serial No. _____

817978R00

EMPYRE ELITE XT HYDRONIC FURNACE
Solid Fuel Fired Furnace

EMPYRE ELITE XT - FOURNAISE HYDRONIQUE Á BRÛLAGE PROPRE
Fournaise au combustible solide

Model No./Certifién de Modèle ☐100 ☐200 Serial No./ N° de Série _____

Certified Heating Appliance CSA Standard B366.1-M91 UL Standard 391-2006/726-06 Standard C22.2 No. 3
Appareil de Chauffage Norme B366.1-M91 de la CSA Norme 391 de ULC - 2006/726-06 Norme C22.2 No 3

Electrical ratings: volts 120, 1 phase, 60HZ, 15 amps max.
Combustion Blowers: Empyre Elite XT 100/200 #702112231 or #70626288
Base - Noncombustible, concrete preferred.
Fuel - Burn wood only.

Classifications électriques: 120 volts, courant monophasé, 60 Hz, maximum de 12 ampères.
Ventilateurs de combustion: Empyre Elite XT 100/200 no 702112231 ou no 70626288
Plate-forme – Non combustible, de préférence en béton.
Combustible – Brûler seulement que du bois.

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Intertek
WN20717

Safety Precautions

- The Empyre Elite XT furnace is designed to work in conjunction with another heat source. We recommend this furnace not to be used as a stand alone unit. Should the system fail or run out of wood, a backup system must be in place.
- The Empyre System Optimizer shipped with this furnace must be installed in order to maintain the warranty.
- For best efficiency and cleanest burn use only seasoned firewood. NEVER burn trash, tires, solvents, plastics, engine oil, gasoline or other flammable liquids, rubber, naptha, household garbage, material treated with petroleum products (particle board, railroad ties and pressure treated, painted, or kiln dried wood), leaves, paper products, or cardboard.
- Start the fire with paper and small kindling.
- The Empyre Elite XT furnace is designed to operate under atmospheric pressure only. ALWAYS keep the vent cap / water level indicator loose over the vent opening. Do not seal or clamp down the vent cap.
- Keep area around the furnace clean at all times to avoid possible fire hazards. Adhere to installation clearance and restrictions.
- The Empyre Elite XT must be installed on a level, noncombustible floor pad, such as concrete or patio blocks.
- The Empyre Elite XT rear access cover is secured with 2 screws. Because of an electrocution hazard and hot surfaces always keep children away. Rear access cover must ALWAYS be in place with screws secured with wrench.
- Read the manual carefully and read all decals on the Empyre Elite XT furnace. Should you have any questions not answered in this manual, contact your dealer.

SAFE DOOR OPERATION:

OUTER DOOR

Always keep outer door closed and latched during normal operation. When door is open always secure door with door stop rod.

LOADING DOOR: ALWAYS OPEN SLOWLY

1. Move **LEVER** above loading door to the left, timer comes on, wait momentarily and **SLOWLY** open loading door. Timer will shut down the furnace after 5 minutes. To reset timer, move lever to the right and then back to the left. Lever in the right position puts the furnace into the normal running mode, timer is then locked out.
2. After loading **CLOSE** and **LATCH** door firmly and move **LEVER** to the right. **DO NOT** operate with loading door open.

ASH REMOVAL DOOR: ALWAYS OPEN SLOWLY

1. **ALWAYS** switch furnace off before opening door. **DO NOT** operate with ash removal door open.
2. **CLOSE** and **LATCH** door firmly.

CAUTION!

Keep children a safe distance from the furnace.

- **DO NOT** use chemicals, gasoline, oil or any other combustible fluid to start the fire.
- **DO NOT** store fuel or combustible materials within the installation clearance area.
- **DO NOT** connect the unit to a chimney flue or vent that serves a gas or other appliance.
- **DO NOT** burn trash in this furnace.
- **DO NOT** pressurize water in furnace.
- **DO NOT** damage furnace. Load wood carefully.
- **DO NOT** run furnace with water level below add mark.
- **DO NOT** operate the furnace below a temperature of 165°F (74°C). This is important in order to maintain the warranty.
- **DO NOT** dump ash close to any combustible materials. Place ash in metal container and away from combustible materials.
- **DO NOT** operate with loading or ash removal doors open.
- **DO NOT** add fuel during a power outage.
- **DO NOT** allow ash and creosote buildup. Furnace must be kept in good condition. Follow cleaning instructions in the Installation and Operation Instruction Manual.
- **DO NOT** use with an automatic stoker unless so certified.
- **DO NOT** modify this unit in any way. Any modification will void the warranty.

In the event of loss of electrical power:

1. Open all flow-check and zone valves in the system. Depending on system design, this may allow convective circulation.
2. It is important to remember that the heating system cannot dispose of a great deal of heat without the circulators running. Avoid over-firing! DO NOT LOAD LARGE AMOUNTS OF SOLID FUEL INTO THE FURNACE! Fire the furnace cautiously until it is determined how quickly the heat system is able to dissipate the heat being produced by the furnace.
3. When the power has returned, reset all flow-check and zone valves and resume normal operation of the system.
4. Check water level.

In the event of a runaway fire:

1. Ensure the firebox door is tightly closed.
2. Close all combustion air inlets on the furnace.

To cool an overheated furnace:

1. Turn all thermostats to their highest temperature setting.

Safety Alert Symbol

The Safety Alert Symbol identifies important safety messages in the manual and on the furnace. When this symbol is present, be alert to the possibility of injury or death. Follow all instructions in the safety message given. This symbol means attention, be alert, and your safety is involved.

Why is SAFETY important to you? Three very important reasons:

1. Accidents disable and can be fatal.
2. Accidents cost.
3. Accidents can be avoided.

Signal Words

Note the use of the signal words: DANGER, WARNING and CAUTION with the safety messages.

The appropriate signal word has been selected using the following guidelines:

⚠ DANGER

DANGER: Indicates an imminently hazardous situation that, if not avoided, WILL result in death or serious injury if proper precautions are not taken.

⚠ WARNING

WARNING: Indicates a potentially hazardous situation that, if not avoided, COULD result in death or serious injury if proper precautions are not taken.

⚠ CAUTION

CAUTION: Indicates a potentially hazardous situation that, if not avoided, MAY result in minor or moderate injury if proper practices are not taken, or serves as a reminder to follow appropriate safety practices.

Safety Decals

Please read and follow directions to ensure safe practices when using the Empyre Elite XT furnace.

1) DANGER/WARNING/CAUTION
   Safety Instructions: Located on the left side near the controls.
2) FURNACE SERIAL DECAL – Located on the left side near the controls.
3) ELECTRICAL/INSTALLATION:
   Located near the back of the side panel.
4) CAUTION: Lid area may be very hot. Switch blower off before opening. Located right of centre back flue clean out cover.
5) WARNING: ELECTROCUTION HAZARD. Always secure door with latch. Tighten with wrench. Located above latch of rear access door.
6. ELECTRICAL WIRING DIAGRAM - Located inside rear access door.
7) SPECIFICATIONS – Located near the back of the side panel of the furnace.

Canadian CSA Requirements

Installation of the Empyre Elite XT as an add-on unit in the Canadian provinces and territories must comply with requirements of CAN/CSA-B365, and changes to the installation must comply with the following CSA requirements:

CSA B139 - for oil-fired

CSA C22.1 - for electric

CAN/CGA-B149.1 or CAN/CGA-B149.2 - for gas-fired

1.

⚠ DANGER

Risk of fire or explosion. **DO NOT** start or fuel the fire using garbage, gasoline, drain oil or other flammable liquids or chemicals.

⚠ WARNING

SAFE DOOR OPERATION:
OUTER DOOR
Always keep outer door closed and latched during normal operation. When door is open always secure door with door stop rod.
LOADING DOOR: ALWAYS OPEN SLOWLY
1. Move **LEVER** above loading door to the left, timer comes on, wait momentarily and **SLOWLY** open loading door. Timer will shut down the furnace after 5 minutes. To reset timer, move lever to the right and then back to the left. Lever in the right position puts the furnace into the normal running mode, timer is then locked out.
2. After loading **CLOSE** and **LATCH** door firmly and move **LEVER** to the right. **DO NOT** operate with loading door open.

ASH REMOVAL DOOR: ALWAYS OPEN SLOWLY
1. **ALWAYS** switch furnace off before opening door. **DO NOT** operate with ash removal door open.
2. **CLOSE** and **LATCH** door firmly.

- For safety keep firebox loading door and ash door tightly closed.
- Follow listed combustibles installation clearances.
- DO NOT store fuel or other combustible materials within the marked installation clearances of the furnace.
- Inspect and clean flues and chimney regularly.
- Follow complete installation, operating and cleaning instructions in the Operator's Manual.

⚠ CAUTION

- **Hot** surfaces do not touch.
- **KEEP CHILDREN** at safe distance.
- **DO NOT** damage furnace. Load wood carefully.
- **DO NOT** add fuel during a power outage.
- **KEEP** water level above the add mark.
- Place ash in metal containers and away from combustible materials.

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2.

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EMPYRE ELITE XT HYDRONIC FURNACE
Solid Fuel Fired Furnace
EMPYRE ELITE XT - FOURNAISE HYDRONIQUE À BRÛLAGE PROPRE
Fournaise au combustible solide

Model No./Certifién de Modèle ☐100 ☐200 Serial No./ N° de Série _____

Certified Heating Appliance CSA Standard B366.1-M91 UL Standard 391-2006/726-06 Standard C22.2 No. 3
Appareil de Chauffage Norme B366.1-M91 de la CSA Norme 391 de ULC - 2006/726-06 Norme C22.2 No 3

Electrical ratings: volts 120, 1 phase, 60HZ. 15 amps max.
Combustion Blowers: Empyre Elite XT 100/200 #702112231 or #70626288
Base - Noncombustible, concrete preferred.
Fuel - Burn wood only.

Classifications électriques: 120 volts, courant monophasé, 60 Hz, maximum de 12 ampères.
Ventilateurs de combustion: Empyre Elite XT 100/200 no 702112231 ou no 70626288
Plate-forme – Non combustible, de préférence en béton.
Combustible – Brûler seulement que du bois.

Manufactured by Pro-Fab Industries Inc. Arborg, Manitoba
Intertek WN20717
Fabriqué par Pro-Fab Industries Inc. Arborg, Manitoba

3.

ELECTRICAL

Electrical Ratings: 120 volts, 60HZ, max breaker size 15 amps. (Blower rating is less than 2 amps.)

For supply connections use No.14 AWG or larger wires acceptable for at least 90°C or equivalent.

For use with aluminum or copper conductors.

INSTALLATION

ADD ON INSTALLATION INSTRUCTIONS
- This furnace can be connected to an existing boiler system.
- Operate the (oil, gas, electric) boiler periodically to ensure it will operate satisfactorily when needed.
- **DO NOT** relocate or bypass any of the safety controls in the original boiler installation.

CAUTION: This equipment may only be installed by qualified personnel.
- Disconnect electric power to both boilers before servicing.

CAUTION: Maintain combustion air supply to both boilers. Air starvation is dangerous. Provide a fresh air opening at least 2,000 mm² (3 in²).

An annual inspection by a qualified service technician is recommended.

INSTALLER INFORMATION:
Name_____
Address_____
_____
Date of Installation_____

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4.

⚠ CAUTION

- LID AREA MAY BE VERY HOT.
- SWITCH BLOWER OFF BEFORE OPENING.

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5.

⚠ WARNING

ELECTROCUTION HAZARD

ALWAYS SECURE DOOR WITH LATCH.

TIGHTEN WITH WRENCH.

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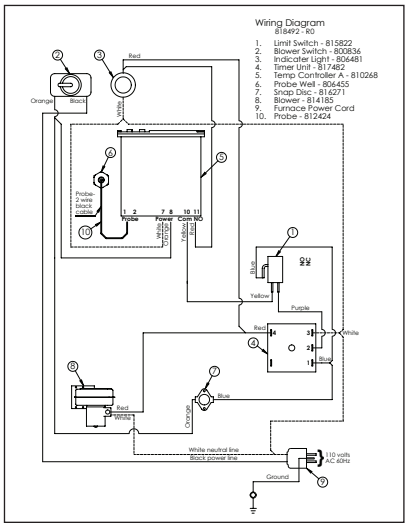
6.



7.

SPECIFICATIONS

Install and use only in accordance with the manufacturer's installation/ operating instructions and local codes. If there are no applicable local codes, an outdoor installation chimney must be listed to the ULC-S610 and ULC-S604 standard and an indoor installation must follow ANSI/NFPA 211 and NFPA90B. Chimney must be a listed UL 103 HT or ULC S629 residential all-fuel type or tile-lined masonry. Flue connector pipe must be made of a minimum 24 NSG black steel. Special precautions are required for passing the chimney through a combustible wall or ceiling. Refer to authorities having jurisdiction for proper installation.

Minimum Clearance to Combustibles	
Side Wall to Furnace	12" (305 mm)
Back Wall to Furnace	12" (305 mm)
Front of Furnace to Combustibles	48" (1220 mm)
Combustibles to Flue	12" (305 mm)
Ceiling to Furnace	24" (610 mm)
Floor*	0" (0 mm)

* For indoor installation a noncombustible liner must be placed under the furnace.

⚠ CAUTION

- **DO NOT** connect the unit to a chimney flue that serves another appliance.
- **DO NOT** burn trash in this furnace.
- **DO NOT** pressurize water in furnace.
- **DO NOT** dump ash close to any combustible materials.
- The heat exchanger, flue pipe, chimney must be in good condition and cleaned regularly to remove accumulated creosote and ash.
- Clean at the end of the heating season to minimize corrosion during summer months.
- Follow cleaning instructions in Operator's Manual.
- Refer to Operator's Manual for complete instructions.

In the event of loss of electrical power:
1. Open all check and zone valves in the system. Depending on system design, this may allow convective circulation.
2. It is important to remember that the heating system cannot dispose of a great deal of heat without the circulators running. Avoid over firing! **DO NOT LOAD LARGE AMOUNTS OF SOLID FUEL INTO THE FURNACE!** Fire the furnace cautiously until you are able to determine how quickly the heat system is able to dissipate the heat being produced by the furnace.
3. When the power has returned, reset all check and zone valves and resume normal operation of the system.

In the event of a runaway fire:
1. Ensure the firebox door is tightly closed.
2. Close all the combustion air inlets on the furnace.

To cool an overheated furnace:
1. Turn all thermostats to their highest temperature setting.

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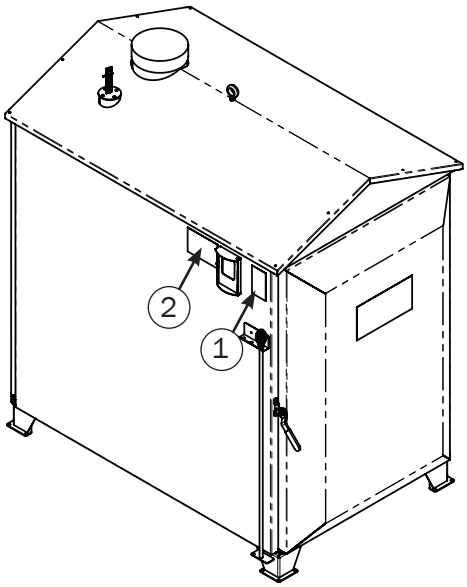
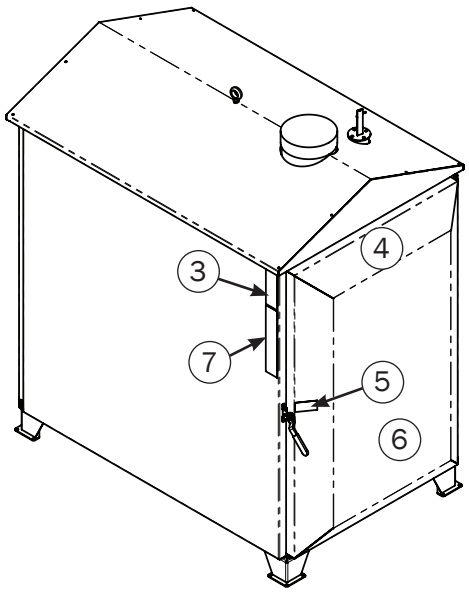
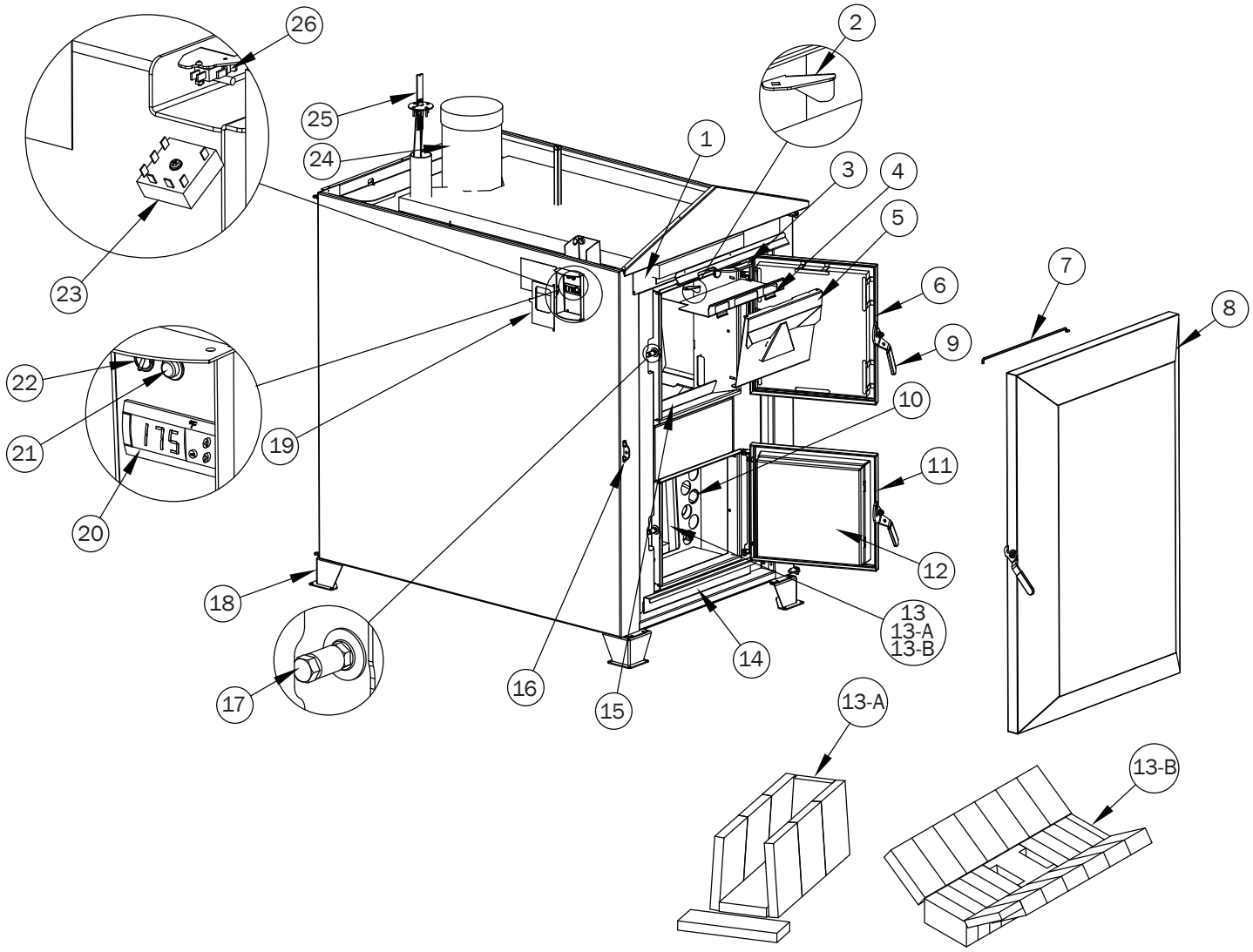


Front View



Rear View

Identifying Main Components - Front View

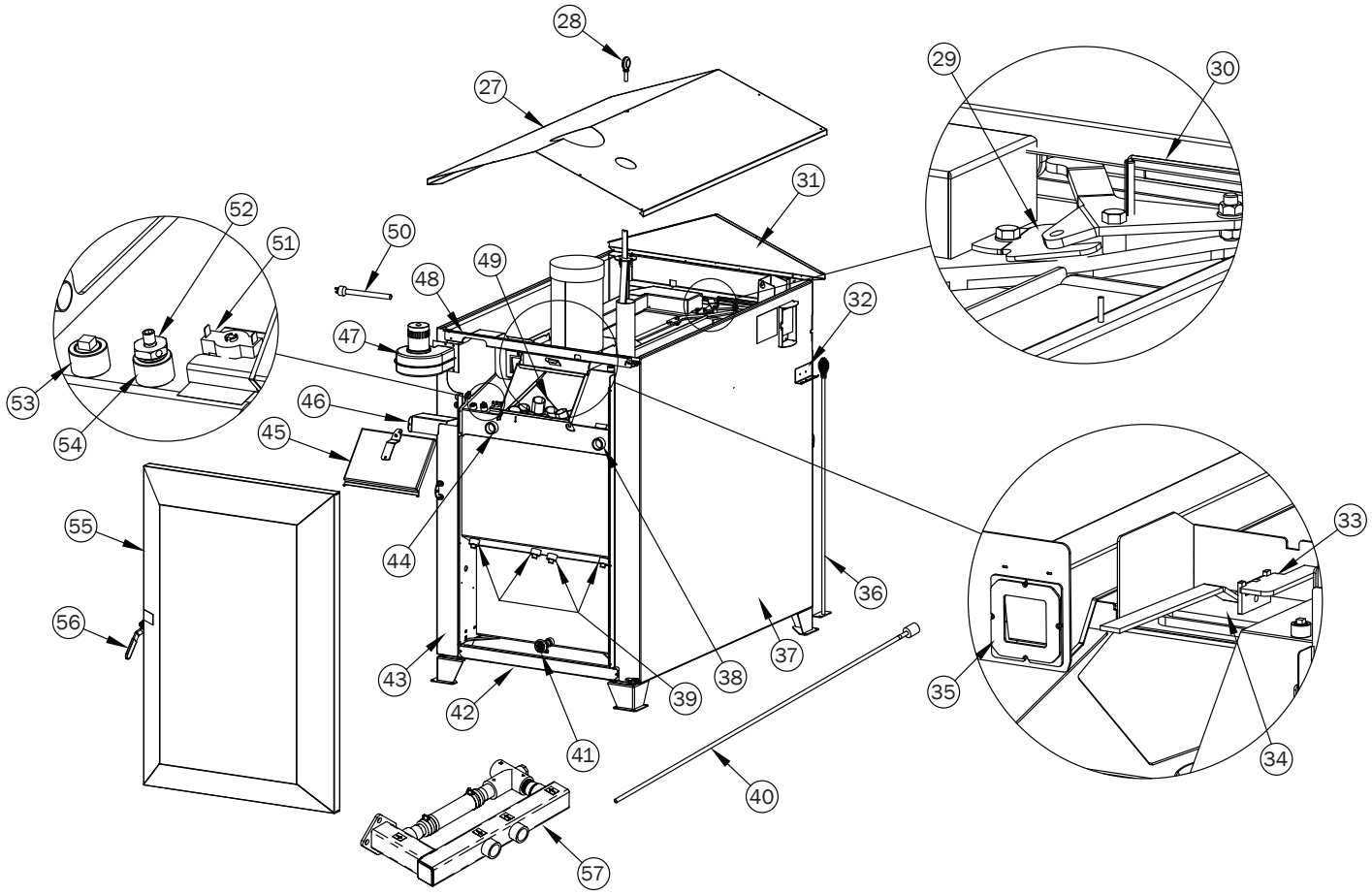


Note: Furnace shown is the Empyre Elite XT 200. Parts on the model 100 will have the same description but appearances may vary.

No.	Description
1	Front Upper Cover
2	Air Pan Lock
3	Exhaust Exit Lever
4	Removable Air Pan
5	Smoke Curtain
6	Loading Door
7	Door Stop Rod
8	Front Access Door
9	Door Handle
10	Heat Exchange Flues
11	Ash Clean Out Door
12	Inner Door Panel
13	Secondary Burn Chamber
13-A	Brick Configuration

No.	Description
13-B	Insulation Board Configuration
14	Ash Tray
15	Smoke Deflector Angle
16	Latch Catch/Locking Bolt - Front & Rear Door
17	Latch Catch Bolt
18	Leg
19	Control Panel Door
20	Temperature Control
21	Blower On/Off Indicator Light
22	On/Off Switch
23	Timer
24	Inner Exhaust Flange - 6" Stove Pipe
25	Vent Cap and Water Level Indicator
26	Limit Switch

Identifying Main Components - Rear View



Note: Furnace shown is the Empyre Elite XT 200. Parts on the model 100 will have the same description but appearances may vary.

No.	Description
27	Roof
28	Lifting Hook
29	Air Gate
30	Switch Trigger
31	Gable
32	Ash Rake & Brush Hanger
33	Smoke Exit Connector Bar
34	Smoke Exit Lid
35	Flapper Unit
36	Ash Rake
37	Left Side Panel
38	Return Port 1” Elite XT 100, 1-1/4” Elite XT 200
39	Electric Element Ports
40	Flue Cleaning Tool
41	Drain
42	Rear Lower Cover

No.	Description
43	Right Side Panel
44	Supply Port 1” Elite XT 100, 1-1/4” Elite XT 200
45	Flue Clean Out Cover
46	Probe Shield
47	Blower
48	Rear Upper Cover
49	Exhaust Area
50	Furnace Power Cord
51	Snap Disc/Furnace Manual Reset
52	Temperature Probe Well A
53	Low Water Cutoff Port/Probe Port B
54	Probe Port
55	Rear Access Door
56	Door Handle
57	Empyre System Optimizer

Optional: Low water cut off switch kit. Ask your dealer for details.

Minimum Clearance to Combustibles

Side Wall to Furnace	12” (305 mm)
Back Wall to Furnace	12” (305 mm)
Front of Furnace to Combustibles	48” (1220 mm)
Flue Pipe	12” (305 mm)
Ceiling to Furnace	24” (610 mm)
Floor*	0” (0 mm)

*See Indoor Installation Requirements below.

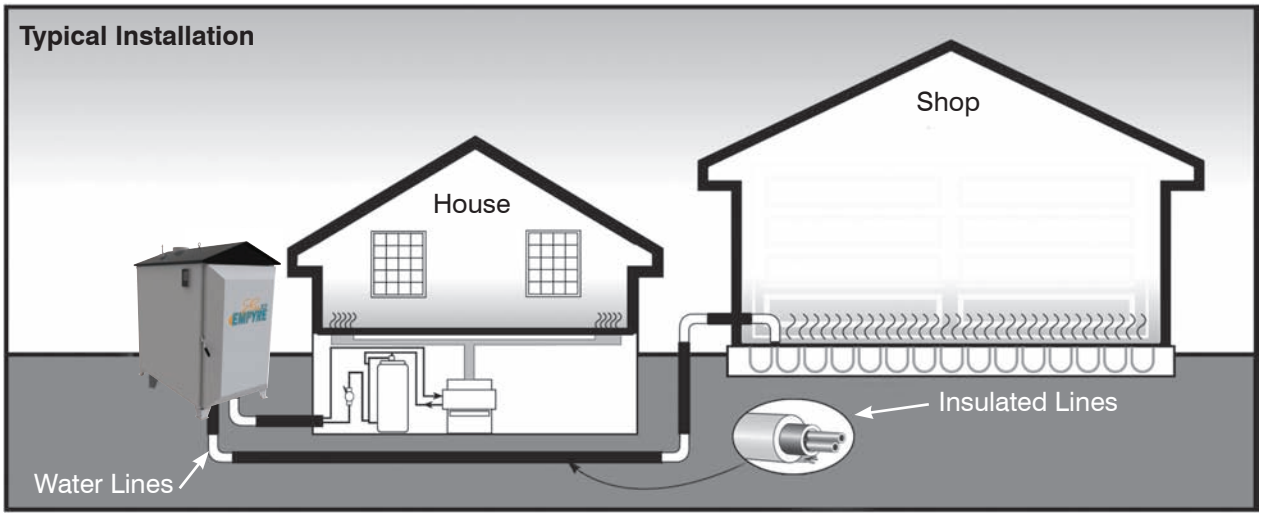
Outdoor Installation Requirements

1. The Empyre Elite XT furnace must be installed on a level, noncombustible floor pad, such as concrete or patio blocks.
2. Install the furnace in a location that best suits wind direction for your home and building(s) and neighbouring residents.
3. Installation of the Empyre Elite XT furnace must be completed in accordance with local, state, provincial and federal building and fire codes.

Indoor Installation Requirements

1. The Empyre Elite XT must be installed on a level stable surface, preferably on a concrete floor but may be installed on a combustible floor provided that a noncombustible liner (such as sheet metal or masonry) be placed on the floor, ensuring the following areas are covered to catch stray embers:
   - Underneath the furnace;
   - At least 16” (406 mm) in front and 8” (203 mm) on either side of the fuel loading and ash removal doors;
   - Underneath the chimney connector and extending at least 2” (50 mm) on either side of the chimney connector.
2. Adhere to minimum clearance to combustibles as stated in this manual and in accordance with local, state, provincial and federal building and fire codes.
3. Install in a large open area when possible. Minimum enclosed, not well vented, room size is 100 square feet (9.3m^2).
4. Room must be vented to outside air, see page 12.
5. This furnace is designed to work in conjunction with another heat source. When installing, DO NOT relocate or bypass any of the safety controls in the original (gas, oil or electric) boiler installation that is to be used as the backup system.

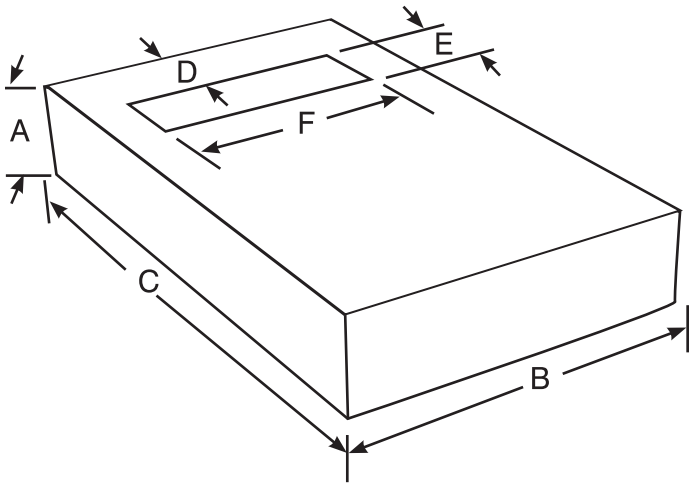
IMPORTANT: Contact an insurance provider prior to installation to ensure that installation is in compliance with local insurance requirements and all terms have been met.



Foundation Dimensions

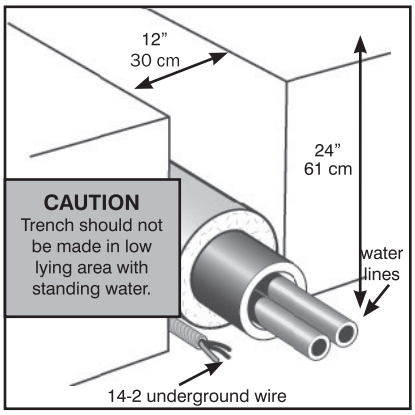
The specifications below provide a stable concrete pad for the Empyre Elite XT furnace. The open area indicated by 'E' in the drawing provides a channel for plumbing and electrical conduit.

NOTE: Furnace can also be installed on concrete patio blocks.



	Empyre Elite XT 100		Empyre Elite XT 200	
	in	cm	in	cm
A	4	10	5	13
B	40	102	44	112
C	59	150	67	170
D	5	13	5	13
E	10	25	10	25
F	16	41	16	41

Trench for Underground Pipes



1. The water lines must be properly insulated to minimize heat loss. Ask your dealer for the right underground water line insulation.
2. Dig a trench, minimum 24 in (61 cm) deep* and 12 in (30 cm) wide, and make as level as possible to avoid damage to the tubing. ** Trench should be at least 36 inches (91 cm) deep under driveways.*
3. The water lines should be a minimum of 1" (2.54 cm) inside dimensions*, rated and approved for use with high temperature water.
   ** Size of water lines depends on distance; consult with a qualified heating professional to determine the line size necessary to meet the demands of your specific application.*
4. Identify each water line clearly in order to correctly locate the supply and return lines.
5. Lay down 14-2 underground wire approved for underground installation. Obtain the required electrical permit and confirm local electrical code requirements prior to installation.

Outdoor Furnace Installation

We recommend that the furnace be installed by a qualified installer.

1. Position furnace on pad. Note: Lift only by top lifting hook or bottom forklift guides. Use caution! Furnace is heavy.
2. Identify and remove components shipped in the furnace, in firebox or rear of furnace: ash rake, flue clean out tool, water level indicator and Empyre System Optimizer.

Outdoor Chimney Installation

Install a 1 inch (2.54cm) insulated chimney that is listed to ULC-S610 and ULC- S604 standards. Apply a bead of high temperature silicone on the outside of the chimney.

For tall chimneys, chimney braces are recommended. It is recommended that a minimum chimney length of 5 feet (1.52m) is used.

IMPORTANT: A spark arrester must be installed if the Empyre Elite XT furnace is used in a high fire risk area.

Indoor Chimney Installation

When installing a new chimney flue, be sure to observe local building codes and the National Fire Protection Association rule: the top of the chimney must extend at least 3.0 feet (0.9 m) above the highest point where it exits the roof and be at least 2.0 feet (0.6 m) taller than any point of the roof within 10.0 feet (3.04 m).

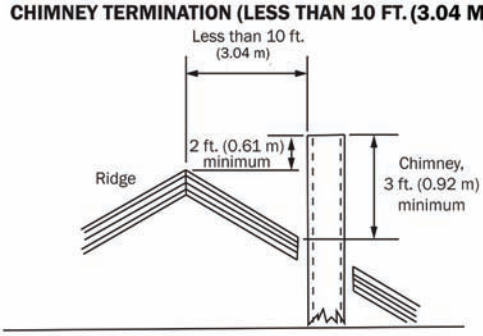
For a new chimney, use an insulated stainless steel system that conforms to type HT (High Temperature) requirements of UL 103 and ULC S629 and complies with the requirements of Chapter 11 of NFPA 211, Standard for Chimneys, Fireplaces, Vents and Solid Fuel-Burning Appliances. Sections of stove pipe (minimum 24 gauge black or blued steel) may be used from the furnace to the insulated chimney. Note: avoid using 90° Elbows; 45° is recommended.

A chimney cap must be installed.

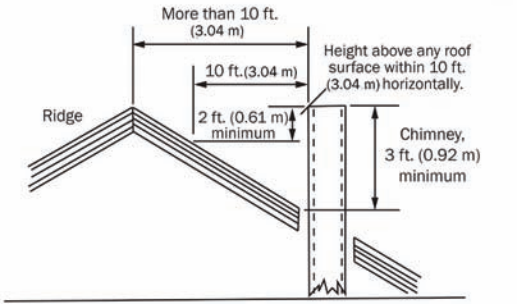
Lining masonry chimneys with a stainless steel liner is recommended.

Furnace	Flue Diameter
Empyre Elite XT 100	6 inches (15 cm)
Empyre Elite XT 200	6 inches (15 cm)

CHIMNEY TERMINATION (LESS THAN 10 FT. (3.04 M))



CHIMNEY TERMINATION (MORE THAN 10 FT. (3.04 M))



IMPORTANT: DO NOT install furnace in a mobile home or trailer.

Supplying Make Up Air

Fireplaces, other furnaces, clothes dryers, exhaust fans, and other appliances all draw air from the room in which they are located. The Empyre Elite XT adds to that draw, making it important to ensure there is an adequate source of fresh air to offset these demands. Otherwise, a negative pressure may be created in the room and starve combustion in the furnace.

1. Determine the volume of space (cubic feet) in the room. Include in the calculation adjacent rooms and areas not closed off by doors.
   Volume (CF) = Length (ft) x Width (ft) x Height (ft)
2. Determine the air input requirements of all appliances in the space. Add them and round the total to the nearest 1000 BTU per hour. The Empyre Elite XT 100 requires 85 CFM (cubic feet/minute), the Elite XT 200 requires 120 CFM.
3. Determine whether the space is 'confined' or 'unconfined' by dividing the total volume of the room by the total input requirements for all appliances in the room.
   a. If the result is equal to or greater than 50 CF/1000 BTU per hour, then consider the space 'unconfined.'
   b. If the result is less than 50 CF/1000 BTU per hour, then consider the space 'confined.'
4. For an 'unconfined' space in a conventionally constructed building, the fresh air infiltration through cracks around windows and doors NORMALLY pro-

vides adequate air for combustion and ventilation, and therefore no additional make up air is required.

5. For a 'confined' space or an 'unconfined' space in a building with unusually tight construction, an additional source of make up air is required. Please consult an HVAC professional to determine the best way to supply make up air for this type of installation.

Important: Furnace room must never be in a negative pressure condition. Negative pressure could result in smoke in the room.

Low Water Temperature Protection

IT IS THE RESPONSIBILITY OF THE INSTALLER TO PROVIDE LOW WATER TEMPERATURE PROTECTION IN THE DESIGN OF THE HEAT DISTRIBUTION SYSTEM

The Empyre Elite XT furnace is no different than an oil boiler or gas boiler in that condensation of the products of combustion will occur if flue gases come in contact with a surface that is less than 140°F (60°C). With an oil or gas boiler the rate of fuel and consistency of the fuel is automatic, so if the temperature of the water in the boiler falls below the desired setting the burner comes on automatically raising the water temperature. The Empyre Elite XT requires an automatic protection from low water temperature because of the manual fuel feed.

Condensation (water) in the boiler tubes will cause corrosion and premature failure. The Empyre System Optimizer, as installed in Figures 1-3, page 14, gives the Empyre Elite XT excellent protection from low water temperatures.

Empyre System Optimizer

The Empyre System Optimizer (ESO) is designed with a low loss header which includes a Danfoss VTC valve, complete with a pump flange and bypass piping. The Danfoss VTC tempering valve was selected for its simplicity and reliability.

The Empyre System Optimizer is mandatory on all Empyre Elite XT installations in order to maintain the warranty.

How the ESO and Valve Operates

The Empyre System Optimizer provides a constant circulation of water through the boiler and the Danfoss VTC tempering valve. Water is drawn off the low loss header by the building piping system and returned to that same loop where it mixes with the water in the low loss header. Before it reenters the boiler, it passes through the tempering valve. If the water entering the valve is too cold, the valve starts to slow the water returning and mixes it with water coming directly from the boiler. If the return water temperature drops below 140°F (60°C) the valve will stop this cold water from entering the boiler. The valve will open again when the boiler water rises in temperature.

Electrical Hookup

Have a junction box with a receptacle installed in the back of the furnace by a qualified electrician to ensure all national and municipal codes are met. This is to be installed inside the back of the furnace on the bottom pan surface or up on either side.

Note: The junction box and receptacle installation is to be a dedicated receptacle to run the furnace and the circulating pumps.

Water Line Hookup

See Figures 1 to 3.

Important: Pump must always be in lowest part of the water line system from the Empyre Elite XT to the building. Pump may be at the furnace or in the building.

Note: The spacing between the tees must be no more than 4 times the diameter of the plumbing line size.

The Empyre System Optimizer may be installed in the vertical position.

IMPORTANT :

The installation drawings in this manual are conceptual drawings only. This furnace is to be installed by a professional plumbing and heating company and qualified electrician. Ensure your installation is suitable for your application, will serve your needs and conforms to all local, provinicial/state and national codes.

The Pro-Fab Industries warranty covers the Empyre Elite XT furnace only and does not include anything outside of the Empyre Elite XT furnace. Pro-Fab Industries takes NO responsibility for installations. DO NOT modify this unit in any way. Any modification will void the warranty.

Figure 1

Empyre Elite XT

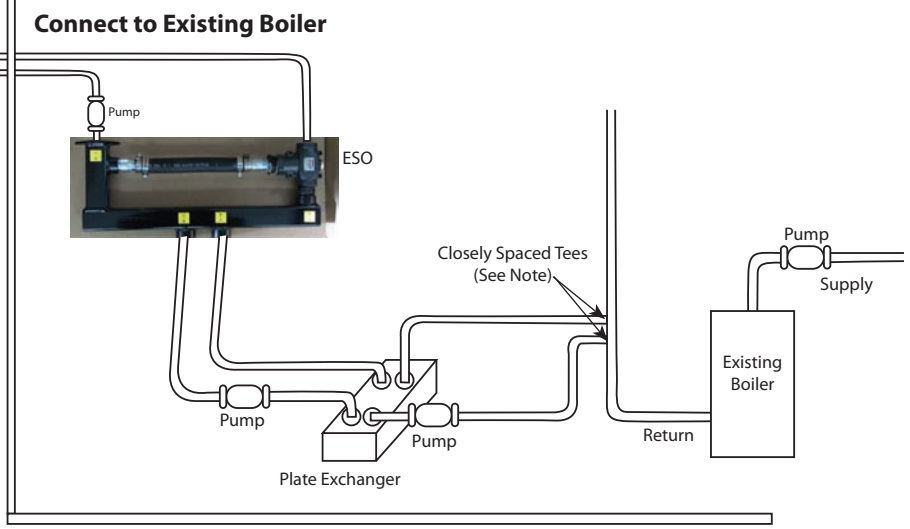


Figure 2

Empyre Elite XT

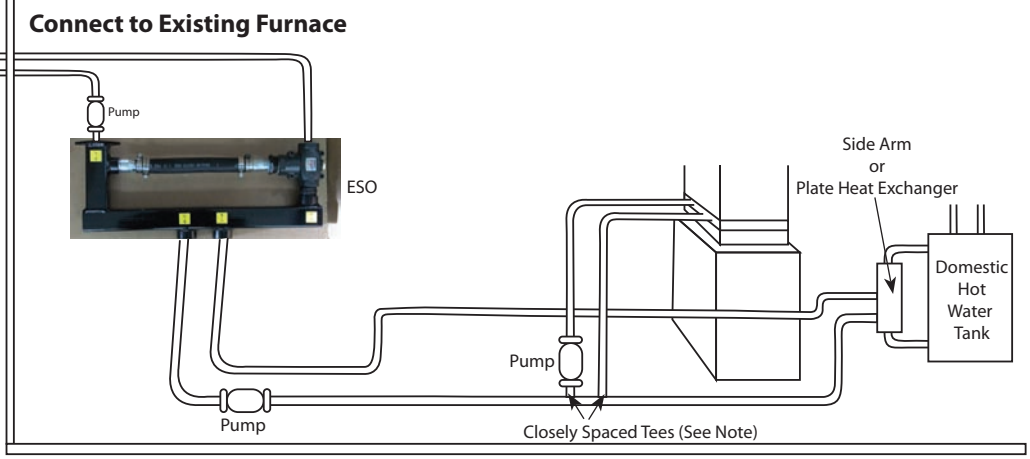
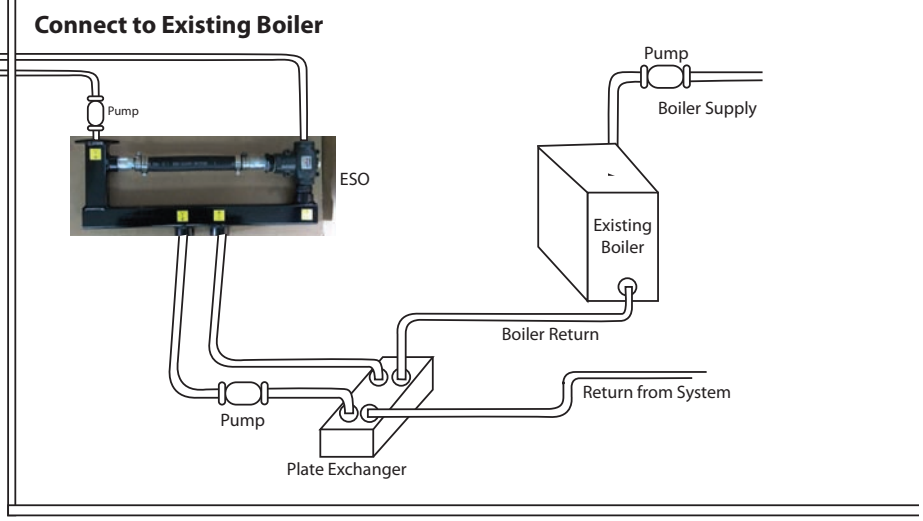


Figure 3

Empyre Elite XT



Side Arm Installation

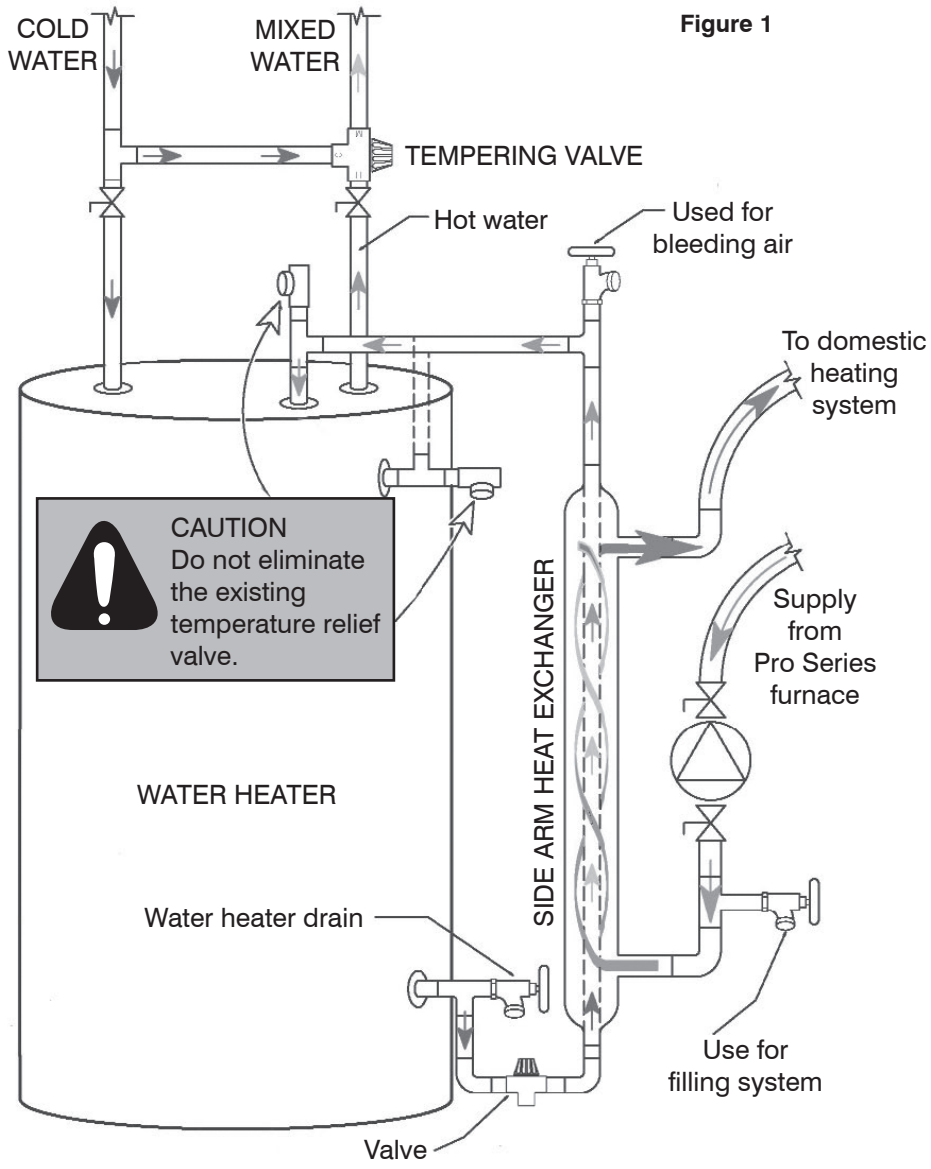


Figure 1

NOTE: Keep bottom loop (and side arm) as low as possible.

Optional Heat Exchanger

Stainless Steel Water to Water Heat Exchanger, Figure 2, can be used in place of a side arm.

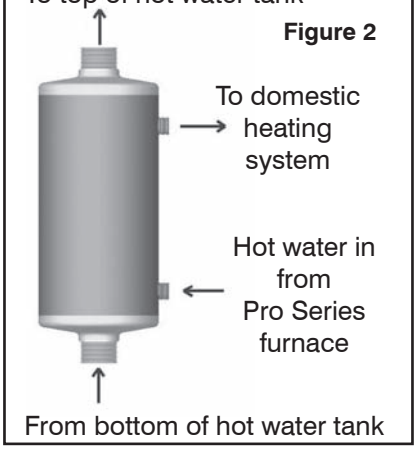


Figure 2

SYMBOL INDEX

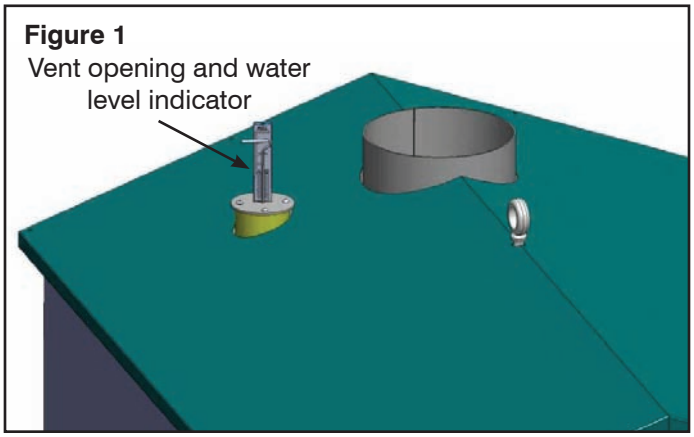
- PUMP
- BALL VALVE
- THERMOMETER
- BOILER DRAIN
- TEMPERING OR MIXING VALVE

Have a qualified electrician and plumber check to ensure all connections to the furnace are made in accordance with the manufacturer's specifications and performed by qualified, licensed personnel in accordance with local building codes.

IMPORTANT

When hooking up the Empyre Elite XT to a domestic hot water heater, a tempering valve must be installed, to prevent scalding hot water from reaching the hot water outlets.

Figure 1
Vent opening and water level indicator



KEEP THE VENT OPENING ON TOP OF THE FURNACE CLEAR OF ANY OBSTRUCTIONS.

IMPORTANT:

1. Use only clean, filtered water in the Empyre Elite XT. Add Pro-Fab approved water treatment to the water to prevent corrosion (available from your dealer). For amount of treatment to add follow instructions on the container.

First Fill

1. Attach a garden hose, with two female ends, from the water supply to the drain (see pg 9). Turn on the water and open drain valve.
2. Check all lines and connectors for leaks.
3. Open the SUPPLY valve (see pg 9) at the furnace and let water run for 2 minutes and then close it.
4. Now open the RETURN valve (see pg 9) at the furnace and let water run for 2 minutes and then close it.
5. Repeat above procedure 3 to 4 times during filling of the furnace. Alternating between lines will ensure that most of the air is bled from the system.
6. When the level indicator shows ADD, shut the drain valve, shut off water and disconnect the garden hose. Note: hot water level is higher than cold water level.
7. Heat furnace to operating temperature (see 'Starting the Fire' below). Check water level again.
8. Add Pro-Fab approved water treatment through vent opening, Figure 1.
9. Check water level when water temperature is 170°F (77°C) and add water until level indicator shows full.

Maintaining Proper Water Level

When the water level is low, the Empyre Elite XT may be filled or topped up through the vent opening, Figure 1.

Starting the Fire in the Hot Water Furnace

Once the Empyre Elite XT has been properly installed, all connections checked thoroughly and the water system is filled to the proper level, the unit is ready for starting a fire.

1. Switch blower on.
2. Place some dry split kindling in the centre of the firebox, on top of some paper, and ignite.
3. Once the kindling begins to burn, add larger pieces of wood until the fire burns briskly. Stir the fire until a sufficient coal bed is obtained. Do not fill the firebox of the furnace to capacity until the water in the furnace is hot.

DO NOT USE THE DOOR AS A LEVER TO FORCE WOOD INTO THE FIREBOX! PIECES OF WOOD SHOULD NOT PROTRUDE INTO THE DOOR FRAME AREA.

NOTE: The Empyre Elite XT has been pressure tested at the factory for water leaks. Some condensation may be observed in the firebox while the furnace is coming up to temperature after the water has become completely cold. To avoid creosote buildup in the firebox and furnace, burn only seasoned wood in the Empyre Elite XT.

Maintaining Proper Water Temperature

Do not operate the furnace below a temperature of 165°F (74°C). **This is important in order to maintain the warranty.**

Understanding the Gasification Process of the Empyre Elite XT Wood Furnace

Wood gasification is an amazingly clean burning and efficient process! It is a process where much of the solid fuel is converted to gases. These gases ignite and burn along with the solid fuel. A large percentage of wood is converted into gases. In order to burn these gases there must be the right amount of air, as well as temperatures of well over 1000ºF (538ºC). Gasification is accomplished in the Empyre Elite XT furnace because:

a) air flow is engineered to provide the correct amount of under fire and over fire air. This setting is calibrated for burning seasoned wood;

b) temperatures high enough to burn the gases are reached in the insulated chamber below the firewood.

A key factor in the gasification process is the wood itself, the type of wood, the moisture content, diameter, length and placement in the firebox. The Empyre Elite XT furnace is not difficult to operate using seasoned wood and by using the following guide it will also work well even when using less than ideal wood.

The gases in the wood are released when the wood surface is exposed to the fire. The more surface area of a piece of wood that is exposed and the drier the wood is, the faster the gases are released. Example: A small DRY piece of burning firewood will release gases much faster than a large WET piece of firewood.

Scenario 1: in the case of the small DRY piece of firewood which has a lot of exposed surface area, the gases are released rapidly and the fire burns very hot but it is starving for air due to the high volume of gases. This will eventually create smoke.

Scenario 2: in the case of the large piece of WET firewood that, in proportion to its mass, has little surface area and will release gases slowly. In this case there is too much air. The air is now cooling the fire resulting in blue smoke and very little heat.

Generally speaking, when burning extremely dry firewood, pieces should be over 5" (12.7 cm) in diameter. If using high moisture wood, use pieces that are less than 5" (12.7 cm) in diameter. It is good to mix the dry and wet wood when possible. When using the recommended seasoned wood, where the moisture content is between 19% and 25%, the diameter of the wood is not that important.

Scenario 1 is also created when stirring a hot fire. Scenario 2 is also created when firewood is too short in relation to the length of the firebox. Correct length of firewood for the Empyre Elite XT 100 is 18" - 25" (45.7 cm - 63.5 cm), the Elite XT 200 is 20" - 28" (50.8 cm - 71.2 cm).

Stack wood pieces side by side. If pieces are short place them end to end making one long piece. Firewood should be centered front to back over the brick slots.

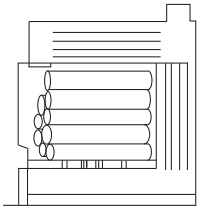
Scenario 2 is also created when wood bridges in the firebox. This is often due to wood with high moisture or lack of careful placement of the wood. Scenario 2 is also created when starting up a cold furnace. Only a small amount of wood is burning with a lot of excess air.

Identifying Smoke Verses Condensation

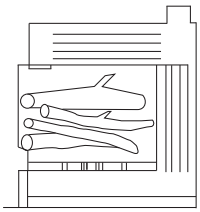
Mostly the exhaust from the chimney will be clear. There are times soon after loading the furnace when a gray vapour may appear. This vapour disappears soon after leaving the chimney. This vapour is moisture being released from the wood. Smoke is more blue in colour and will not disappear as quickly as the gray vapour. On a cold winter day what looks like smoke may only be vapour.

Loading Wood into the Firebox

1. The right time to add wood is when there still is a good layer of charcoal or wood left, but not so much that it is difficult to stir.
2. Using the ash rake, gently pull the charcoal away from the back of the firebox. Stir the charcoal sufficiently so that ash falls down through the brick slots. Always ensure that the brick slots are not blocked by ash buildup. Place wood into the firebox, DO NOT throw, as this may damage the brick lining.



Correct:
The firebox should be loaded with wood of proper length. This will lengthen the burn time.



Incorrect:
The firebox loosely filled with irregular pieces of wood will decrease burn time and may cause unnecessary bridging.

Larger diameter and irregular shaped logs are more likely to cause wood to hang up or 'bridge.' Place the larger logs on top.

3. Load wood into the firebox.

   Centre wood in the firebox. There should be a gap of several inches between the wood and both the front and back of the firebox. Placing wood up against the back of the firebox can result in unburned wood which can cause logs to hang up.

4. For the most efficient burn always keep the brick hot by maintaining wood in the firebox.
5. DO NOT cover the brick slots when placing wood into the firebox.

Daily Routine

Morning Loading:

Load wood into the unit as described above.

Late Afternoon Check:

Check the unit to ensure there is sufficient wood to burn until the end of the day. Load just enough fuel to ensure a bed of burning charcoal is in the firebox prior to the night loading.

Note: The firebox is hottest when the wood has burnt down to a bed of charcoal. When the primary chamber has burnt down to this level, the firebox will dry out and burn most of the accumulated creosote on the walls. If the primary chamber is full all of the time, the temperature in the firebox stays quite cool and creosote may build up on the walls.

Night Loading:

Rake the coal and ash from the perimeter of the firebox and especially from the back wall of the chamber where ash tends to build up. With the ask rake, pull the ash and charcoal away from the walls. The force of the fan will blow the ash into the lower chamber on its own. If this is done every day the ash should fall through the slots easily.

Load wood into the unit as described above.

Cleaning Out Ash

Firebox and Secondary Burn Chamber

Ash in the secondary burn chamber should be cleaned out weekly or as necessary, depending on fuel quality and burn rate. Clean ash out of the secondary burn chamber first. Then clean the firebox. Otherwise hot wood coals will be scraped out of the secondary burn chamber along with the ash.

To clean ash out of the firebox, gently rake it into the secondary burn chamber through the opening in the bottom of the firebox. It is important to rake ash buildup away from the back wall of the firebox.

1. Do this when the fire has died down before reloading furnace. Switch blower off.
2. Open ash clean out door.
3. Pull out ash tray.
4. Reach the ash rake to the back of the chamber and pull ash forward into the ash tray. Do not scrape all of the ash into the ash tray. It is recommended to leave 1”-2” (2.5 - 5.1 cm) of ash covering the floor of the firebox.
5. Firmly close and latch ash clean out door.
6. Switch blower on.

Flues and Chimney

Switch furnace off.

For highest efficiency clean the heat exchanger flues weekly or as necessary.

1. Clean ash from secondary burn chamber before cleaning flues.
2. Remove flue clean out cover (see page 9).
3. Push brush completely through flues. Should the brush be too difficult to push through, then first push the rod through and pull from the other end.
4. Inspect and clean any buildup in the exhaust area.
5. Install clean out covers and secure rear access door latch with bolt and tighten with wrench.
6. Open ash clean out door and ensure the ash is cleared from the flues.

Switch furnace on.

Disposal of Ash

Ashes should be placed in a metal container with a tight fitting lid. The closed container of ashes should be placed on a noncombustible floor or on the ground, well away from all combustible materials, pending final disposal. If the ashes are disposed of by burial in soil or otherwise locally dispersed, they should be retained in the closed container until all cinders have thoroughly cooled.

Creosote - Formation and Need for Removal

When wood is burned slowly, it produces tar and other organic vapors, which combine with expelled moisture to form creosote. The creosote vapours condense on the relatively cool firebox walls of a slow burning fire. As a result, creosote residue accumulates on the firebox walls. When ignited this creosote makes an extremely hot fire. To reduce the amount of creosote, a small intense fire is preferrable to a large smoldering one.

Fire Brick and Insulation

The secondary burn chamber of the Empyre Elite XT high efficiency furnace is lined with high temperature insulation. It is designed to sustain high furnace temperatures and regular operation for many years. The floor of the firebox is lined with brick. To see signs of wear and cracking of the brick is normal.

Take the following precautions to protect the fire brick and maintain optimal performance.

1. Do not carelessly throw heavy pieces of wood onto the brick.
2. Gently rake ashes out of secondary burn chamber.
3. Do not damage brick while stirring the fire.
4. Do not attempt to cool down hot bricks quickly.
5. Do not run furnace with pieces of brick missing.
6. Do not alter the brick and insulation layout. This layout has been carefully engineered to achieve the best performance.

Blower Draft Setting

The blower and flapper unit flap opening settings are pre-determined by the factory and must NOT be altered. Altering these components could cause damage to the furnace and void the warranty. To replace any of these components you must contact your Empyre Elite XT dealer.

NOTE: This is not a natural draft furnace. It is a forced air furnace where the blower controls the fire.

Doors

The Empyre Elite XT doors have an adjustable hinge and latch. Adjust doors to maintain a tight gasket seal. Keep doors closed and maintain all door seals in good condition.

Exhaust Exit Lever Operation

When the exhaust exit lever above the loading door is in the right hand position, the furnace is in its normal operating mode. When the lever is moved to the left, the furnace is now in the loading mode. In the loading mode the exhaust exit is open at the rear top of the firebox and air is directed in front of the baffle. The blower will only run for a timed period and then shut off. To reactivate the timer, the lever must be moved to the full right position and then back to the left position, or switch furnace off and back to on.

Loading procedures:

1. Move lever to the left hand side and wait momentarily. Slowly open the loading door.
2. Rake the ash and load the firebox. Note: if blower shuts down before loading is complete, reactivate by moving the lever fully to the right and then back to the left.
3. Close door securely and move lever fully to the right. Note: if the lever is not fully to the right the furnace WILL NOT operate.

To maintain optimal performance:

1. Do not leave loading door open for extended periods of time, especially when the fire is very hot.
2. Do not force the loading door open beyond the stop.

Power Outages

The Empyre Elite XT furnace, unlike a gas or oil fired appliance, does not stop generating heat when the power is interrupted even though the blower automatically shuts off causing the fire to die down. As a result the heat transfer fluid in the furnace may overheat and boil off through the vent. When power resumes be sure to check the fluid level.

Operation Do's and Don'ts

1. When loading wood keep the loading door open for the least amount of time as possible.

2. After loading wood, when wood is burning hot DO NOT open the loading and ash doors for several hours. This will avoid hot discharge from the doors and keep chimney temperatures at a proper operating level.

3. When wood is burning hot DO NOT unneccesarily shut off the furnace and then turn it back on. Wait at least 10 minutes before turning it back on. This will avoid back pressure coughing through the chimney when the furnace comes back on.

4. DO NOT open ash door when the wood is burning hot or just after the furnace shuts off. If not sure, open loading door first before ash door. This will avoid hot discharge from the open door.

5. DO NOT fill the firebox with very dry wood. Extremely dry wood will burn excessively fast which will cause smoke, back pressure and coughing through the chimney.

6. Reloading when the wood is burnt down to only ashes (the same applies for starting a new fire): start fire with paper and small pieces of wood, then continue adding bigger pieces. After 10 minutes, reposition the wood. In some instances you may need to reposition the wood several times. Important: DO NOT have door open or lever to the left more than necessary. If there is only smoke and the air from the open door ignites the fire, the slots are plugged and the wood needs to be repositioned to ensure air is flowing into the secondary burn chamber.

When the brick has cooled, it will take extra effort to get a good fire going as the wood will bridge more.

7. Always keep some hot wood coals on the brick. As needed, level off the bed of coals with the rake before reloading.

During Heating Season

1. Establish a daily routine for storage of fuel and care of the furnace. Check frequently for crusted ash buildup until experience shows how often cleaning is necessary. Be aware that the hotter the fire, the less creosote, and that weekly cleanings may be necessary in mild weather, even though monthly cleanings may be enough in the coldest months. Have a clearly understood plan in place in the event of a chimney fire.
2. The secondary burn chamber must be cleaned out weekly as necessary. Ensure that the ash clean out door is securely closed after each cleaning.

   Place ashes in a steel container with a tightly fitting lid. Other waste should not be placed in the container with the ashes.
3. Check the water level daily, ensure the level is well above the “ADD” mark.

   Oxygen buildup causes corrosion inside the water system. Keeping the water reservoir completely full prevents oxygen buildup, especially during the summer months when the furnace is not in use.
4. Check the door and lid gaskets to ensure an air tight fit. Adjust hinges and latch as needed.
5. Check and clean the heat exchanger flues weekly. A buildup in the flues and chimney will cause a poor draft and reduce efficiency.
6. Check and clean the air passages in the upper loading door frame several times during the heating season. To clean the air passages, remove the air pan.

   To remove the air pan, swing the smoke curtain into the horizontal position and pull the air pan lock forward. See Figure 1. Drop the air pan down and pull forward, removing the air pan with the smoke curtain.

   Inspect and clean the two rectangular air passages on the upper door frame as well as removing any buildup on the air pan. Move Run/Load lever to expose air passages. Move the Exhaust Exit lever back and forth to ensure easy movement.

   To reinstall, guide the air pan into the slots on either side of the door frame. See Figure 1. Push in and up, and secure in place by pushing the air pan lock back into the lock position.
7. Cover plates and guards must be in place at all times, except during maintenance and servicing.
8. Rear access door must be secured with latch lock bolt. See page 9. Tighten with a wrench.
9. All doors must be closed during operation.
10. Operate the backup heating system (gas, oil or electric) periodically to ensure that it will operate satisfactorily when needed.

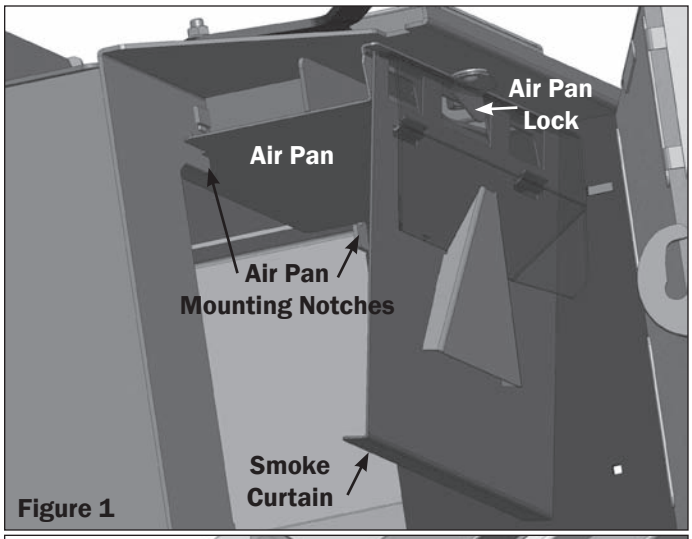


Figure 1

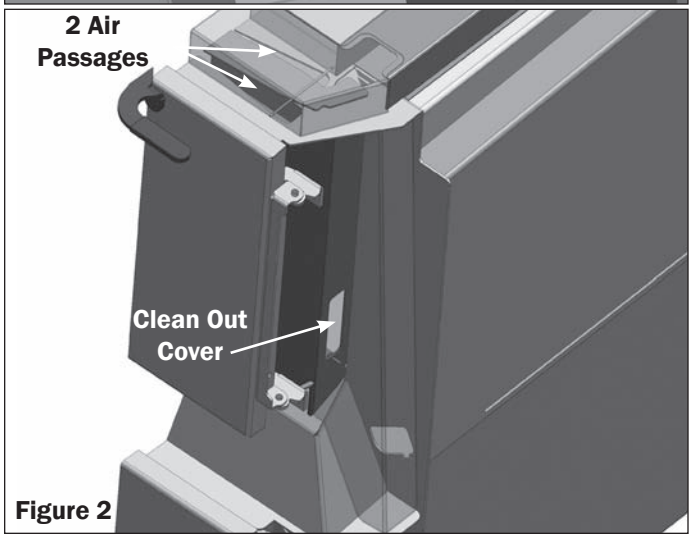


Figure 2

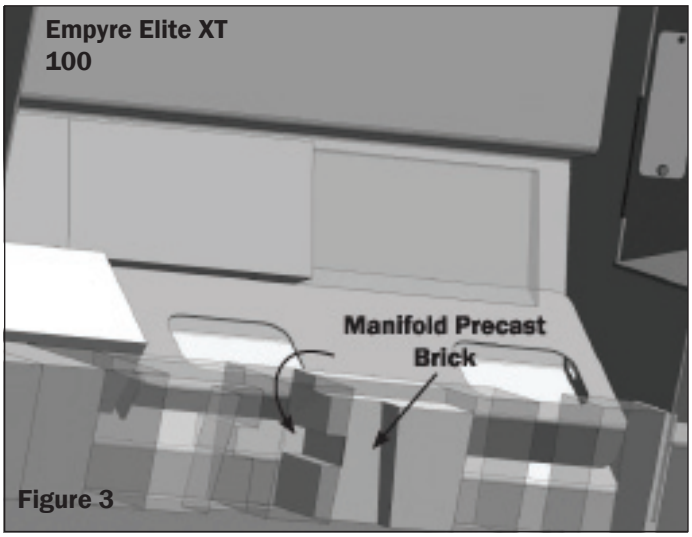


Figure 3

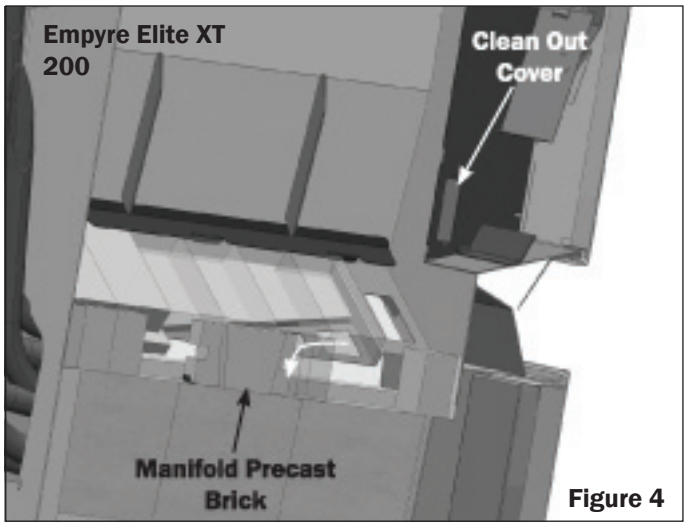


Figure 4

End of Heating Season

1. Thoroughly clean the exhaust area, secondary burn chamber, and flues of any loose or crusted ash buildup. Crusted ashes are easier to remove when furnace is still warm. Note: a thin black coating in the firebox is acceptable, but ensure that there is no ash in contact with bare metal.
2. Check for damaged brick and replace as necessary. Contact your dealer for replacement brick.
3. Inspect and clean air passage under right hand firebox brick. See Figures 2-4.
   a. Remove bricks to expose air passage. Clean areas as needed.
   b. Turn blower on by moving lever to the right into the Run position and check for airflow in front right hand corner of the firebox. See Figures 2-4. If there is no airflow, remove clean out cover and clean.
   c. Install bricks (see Brick Layout applicable to furnace model on pages 26 and 27).
4. Check to ensure there is no moisture in any part of the inside of the firebox, secondary burn chamber, or exhaust area. Apply a thin film of oil in the flue area and exhaust area.
5. Chimney must have a rain cap.

   Failing to properly clean the furnace and protect it from moisture during the off-season will void the warranty.
6. **DO NOT** run the furnace in the summer months when the load demand is very low (ie., only domestic hot water is being heated.)
7. Ensure the water reservoir is full during the non-heating season to prevent corrosion inside the water jacket.
8. Ensure proper amount of water treatment is in the system. In the event that there has been water loss through the season, additional water treatment will need to be added. Follow the treatment ratio on the bottle for additional gallons of water added to the system. It is acceptable to add more than is specified on bottle. Operate the water circulating pump for 24 hours after adding water treatment to ensure proper mixing of the water treatment with the water.
9. A water sample must be drawn 30 days after purchase of the unit and forwarded to your dealer for testing. Maintain the results of this test on file. Thereafter, draw a water sample once a year and forward to your dealer for testing.

   Water properly treated with Pro-Fab approved water treatment should have a ph level between 8.8 and 11.0, a nitrate level between 730 and 1460 ppms as NaN02, and a conductivity must be less than or equal to 4000 mmhos.

   If the pH is not within tolerance, treat by adding a ratio of 1 part of Pro-Fab approved Wood Burning Furnace Treatment (WBFT) to 300 parts of system water and retest after one week. If the nitrate is less than 730 ppm, treat by adding a ratio of 1 part WBFT to 300 parts of system water and retest after one week. If the conductivity is higher than 4000 micromhos, drain 50% of the system water. Refill and treat by adding a ratio of 1 part WBFT to 300 parts of system water and retest after one week.

   Failing to use Pro-Fab approved water treatment in accordance with the Installation and Operation Instruction Manual will void the warranty. See your dealer for authorized supplies. It is the responsibility of the owner to maintain yearly water sample results on file.

Operating the Digital Temperature Switch (DTS)

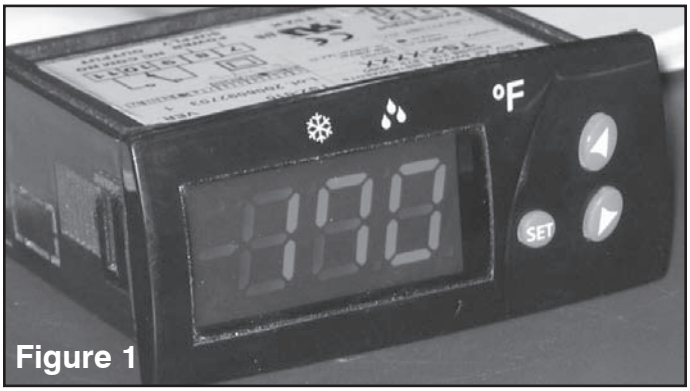
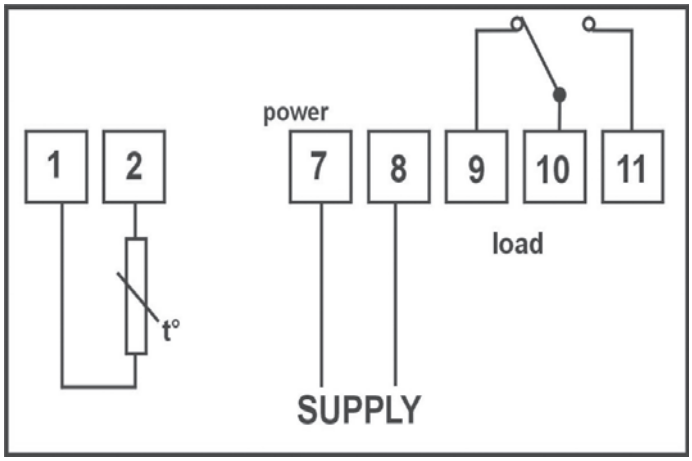


Figure 1

DTS Description

The digital temperature switch is designed for many heating and cooling applications. The probe temperature (Figure 1) is displayed on the bright 3-digit, red light emitting diode (LED). The user is able to adjust the damper on-off temperature set points using the front keypad. The unit features a 16 amp, single pole, double throw (SPDT) relay with the temperature display in degrees Fahrenheit.

DTS Wiring Diagram



DTS Display Messages

In normal operation, the probe temperature will be shown on the display. In case of an alarm or error, the following messages will be shown:

Er = Memory error

- - = Short-circuit probe error

∞ = Open probe error

DTS Technical Data

Accuracy: ±1°

Output: 16 Amp 1HP 240 Vac SPDT relay

Supply voltage: 115 Vac ± 10%

Display: 3-digit, red.

DTS Programming

- Press SET. SP text will appear on the display.
- Press SET again. The real value is shown on the display.
- The value can be modified with the UP and DOWN arrows.
- Press SET to enter new values.
- Press SET and DOWN at the same time to exit programming or wait one minute and the display will automatically exit the programming mode.

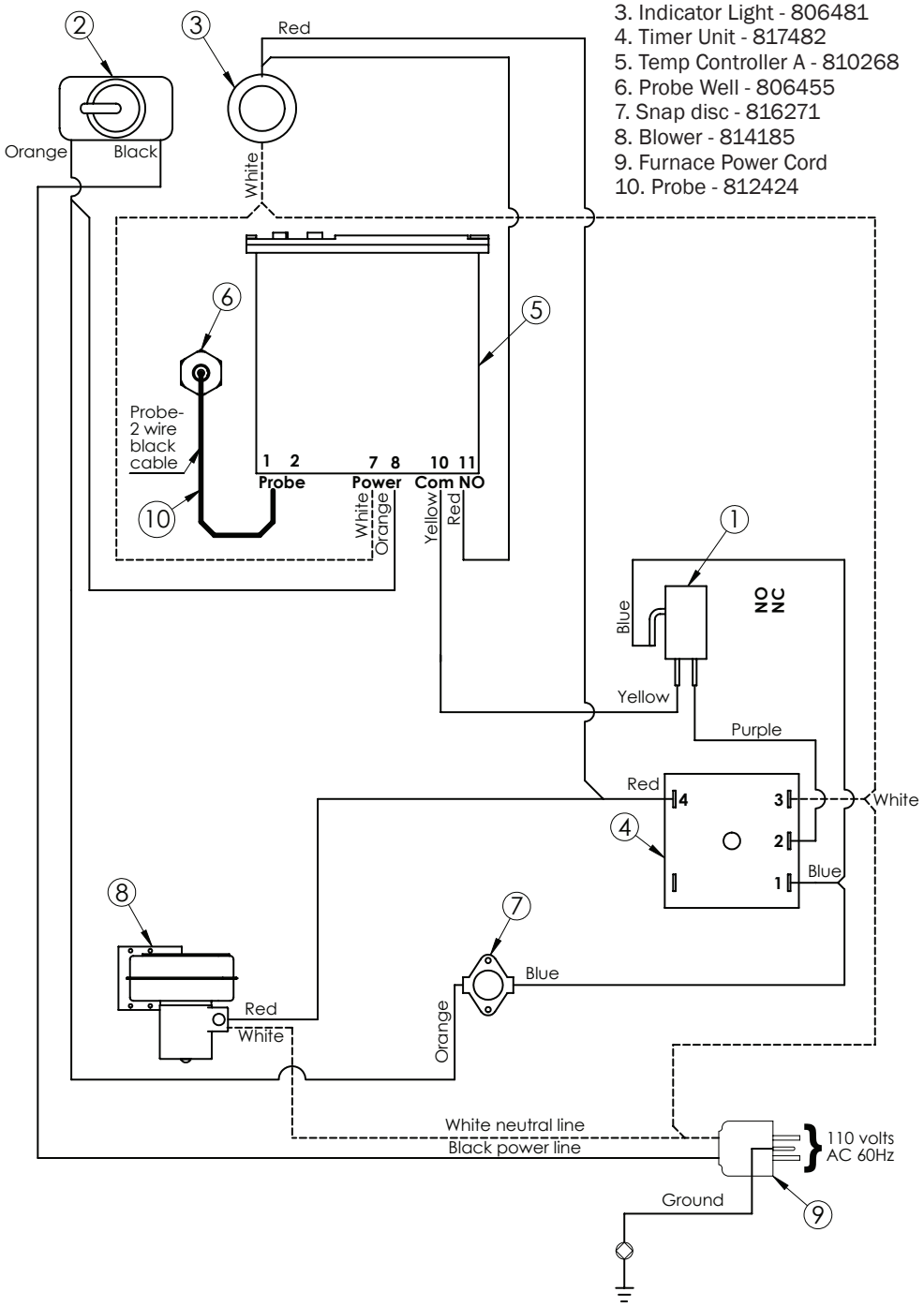
NOTE: Only the temperature setting is programmable. All other settings are locked.

DTS Maintenance/Repair

After final installation of the digital temperature switch, no routine maintenance is required. This device is not field repairable and should be returned to the factory if recalibration or other service is required.

Any modification or tampering with the factory settings of the DTS will void the furnace warranty.

Wiring Diagram
818492R00
1. Limit Switch - 815822
2. Blower Switch - 800836
3. Indicator Light - 806481
4. Timer Unit - 817482
5. Temp Controller A - 810268
6. Probe Well - 806455
7. Snap disc - 816271
8. Blower - 814185
9. Furnace Power Cord
10. Probe - 812424



CAUTION

DO NOT CONNECT THE ELECTRICAL COMPONENTS OF THIS UNIT TO ANY OTHER ELECTRICAL APPLIANCE.

DO NOT MODIFY THE ELECTRICAL COMPONENTS OR ANY OTHER PART OF THIS FURNACE. MODIFICATION TO ANY PART OF THIS FURNACE WILL VOID THE WARRANTY.

How to Correct a Sticking Flapper

How to Check if the Flapper is Sticking

1. If the fire burns well when loading door is open but dies out when door is closed.
2. If little or no exhaust is present at the chimney when blower is running. (Open rear door to ensure blower is running.)

How to Correct a Sticking Flapper

1. Check information to determine if the furnace is being operated properly.
2. Shut off furnace.
3. Insert wire or hex saw blade through the blower impellor towards blower exit. Insert wire through pin hole on top surface of the blower, next to blower exit mount.

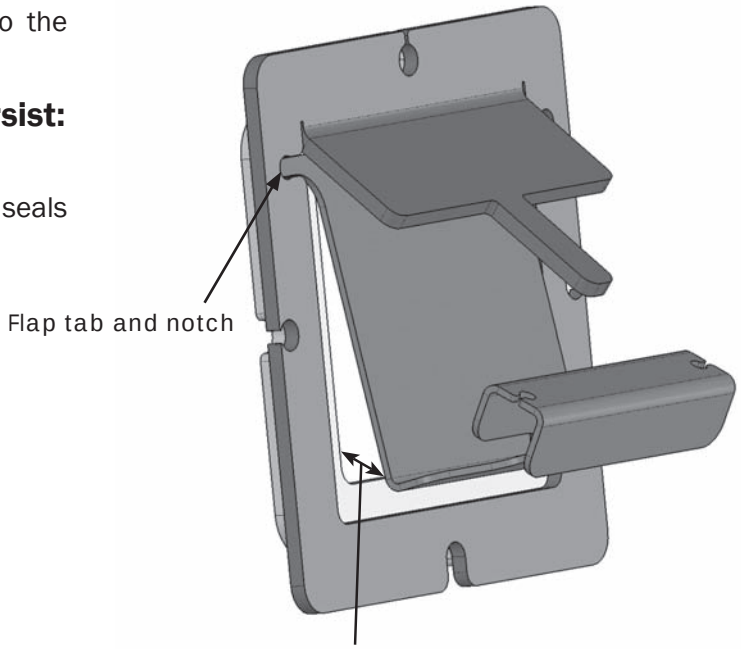
   Note: The flap opening and closing should be heard when activated.
4. Turn furnace back on.
5. With blower on, carefully spray lubricant into the blower for 5 seconds.

Should the Flapper Sticking Problem Persist:

1. Check if furnace is being operated properly.
2. Remove flapper unit, check to ensure the flap seals in the closed position, clean and oil.

How to Remove and Reinstall

1. Disconnect power.
2. Remove blower bolt (use 5/16” socket with long extension). Pull back on motor to remove.
3. Remove flapper (2 bolts - use 5/16” socket).
4. Inspect flapper. Upper tabs on flap must seat in notches. When laying flat with flap closed, tabs must not be higher than flush with frame surface. Check with a straight edge; also check if flap in closed position makes an air tight seal. Also check flap opening setting, gap should be 3/8” (10 mm) for the Empyre Elite XT 100 and 3/4” (19 mm) on the Empyre Elite XT 200.
5. Generously apply oil to the flap on the sealing surfaces.
6. To install make sure flap will not fall out of flapper unit. If this is a problem simply apply tape at flap tabs before installing.
7. Bolt the flapper unit into place, then bolt the blower into place.



Empyre Elite XT 100 - Gap to be - 3/8” (10 mm)
Empyre Elite XT 200 - Gap to be - 3/4” (19 mm)

Furnace Specifications	Model 100		Model 200	
Heat Output (Peak)*	125,000 BTU/hr	37.0 kWh	220,000 BTU/hr	64.4 kWh
Heat Output (8 Hour Burn)*	66,000 BTU/hr	19.3 kWh	110,000 BTU/hr	32.2 kWh
Heat Output (12 Hour Burn)*	45,000 BTU/hr	13.2 kWh	72,000 BTU/hr	21.1 kWh
Furnace Width	36 in	91 cm	40.5 in	103 cm
Furnace Height	64 in	163 cm	69.5 in	177 cm
Furnace Length	59 in	150 cm	67 in	170 cm
Firebox Dimensions	19w x 21h x 28d in	48w x 53h x 71d cm	22.5w x 26h x 31.5d in	57w x 66h x 80d cm
Firebox Volume	6.1 ft^3	173 L	10 ft^3	283 L
Loading Door Opening	16 x 14 in	41 x 36 cm	18.5 x 16.5 in	47 x 42 cm
Flue Collar Diameter	6 in	15 cm	6 in	15 cm
Log Length	24 in	61 cm	25 in	64 cm
Log Diameter	6 in	15 cm	6 in	15 cm
Furnace Weight (excluding pallet)	1,050 lb	476 kg	1,635 lb	742 kg
Water Capacity	60 US Gal.	227 L	112 US Gal.	424 L

Note: Weights and measurements may vary slightly.

*Will vary based on fuel type and quality.

For overall unit dimensions, see Figure 1, Model 100 on page 26; Model 200 on page 27
For brick layout, see Figure 2, Model 100 on page 26; Model 200 on page 27
For refractory layout, see Figure 3, Model 100 on page 26; Model 200 on page 27

Optional - FlueActive Cleaning Tool

Contact your local dealer for more information on the options available for your furnace and to order furnace replacement parts. Identify parts by referring to components throughout this manual. Furnace replacement parts must be purchased through Pro-Fab Industries by your dealer in order to maintain the furnace warranty.

Model 100
Figure 1 - Unit Dimensions

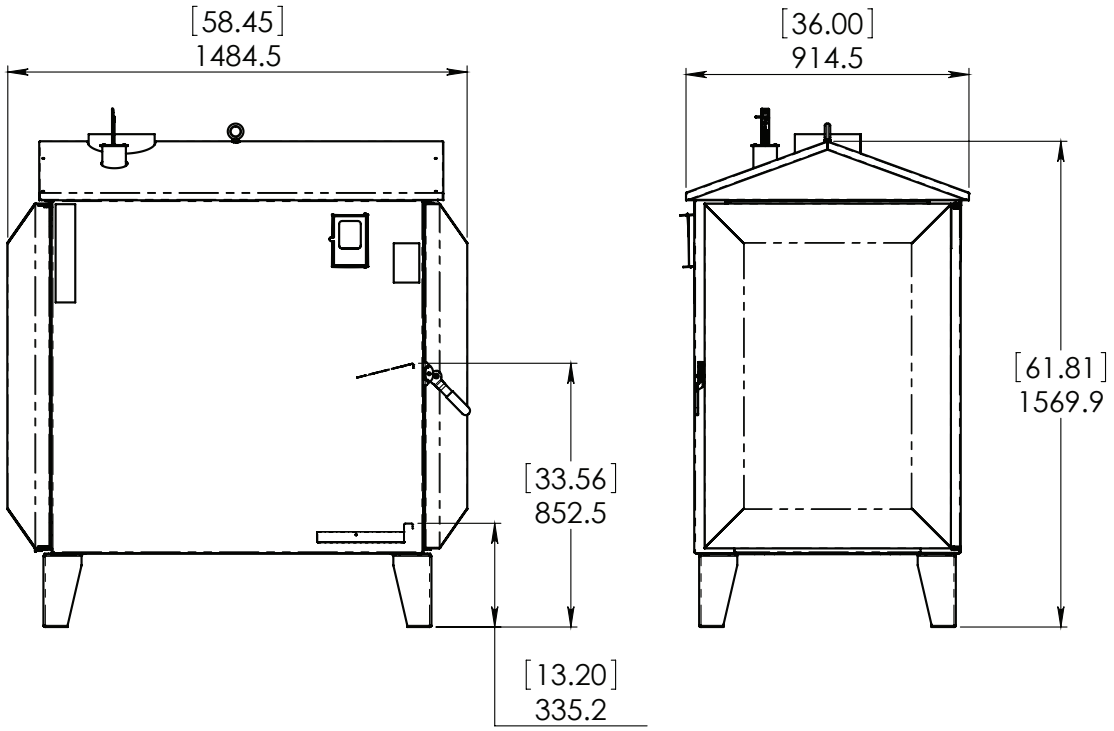
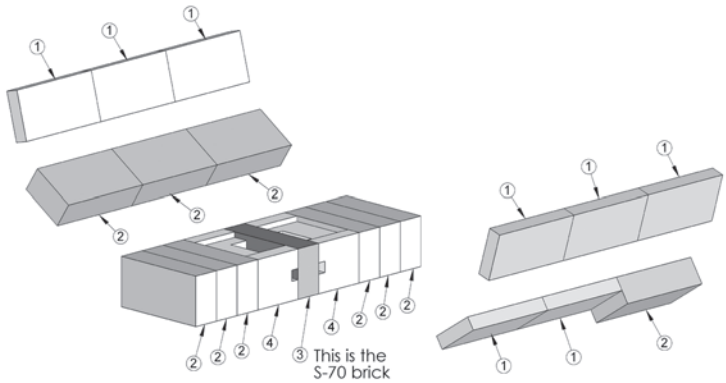
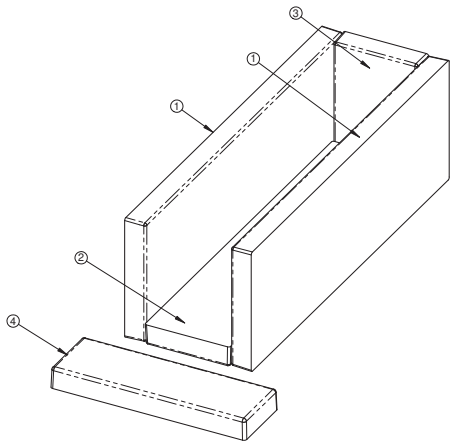


Figure 2 - Brick Layout



ITEM NO.	DESCRIPTION	QTY.
1	Brick, Fire, 1.25 in. x 4.5 in. x 9 in.	8
2	Brick, Fire, 2.5 in. x 4.5 in. x 9 in. Medium Duty	10
3	Brick, Fire, Alumina S-70, 2.5 in. x 4.5 in. x 9 in.	1
4	Cast, Manifold	2

Figure 3 - Refractory Layout



ITEM NO.	DESCRIPTION	QTY.
1	Insulation, Fibre Board, Side, Burn Chamber	2
2	Insulation, Fibre Board, Bottom, Burn Chamber	1
3	Insulation, Fibre Board, End, Burn Chamber	1
4	Insulation, Fibre Board, Front, Burn Chamber	1

Model 200
Figure 1 - Unit Dimensions

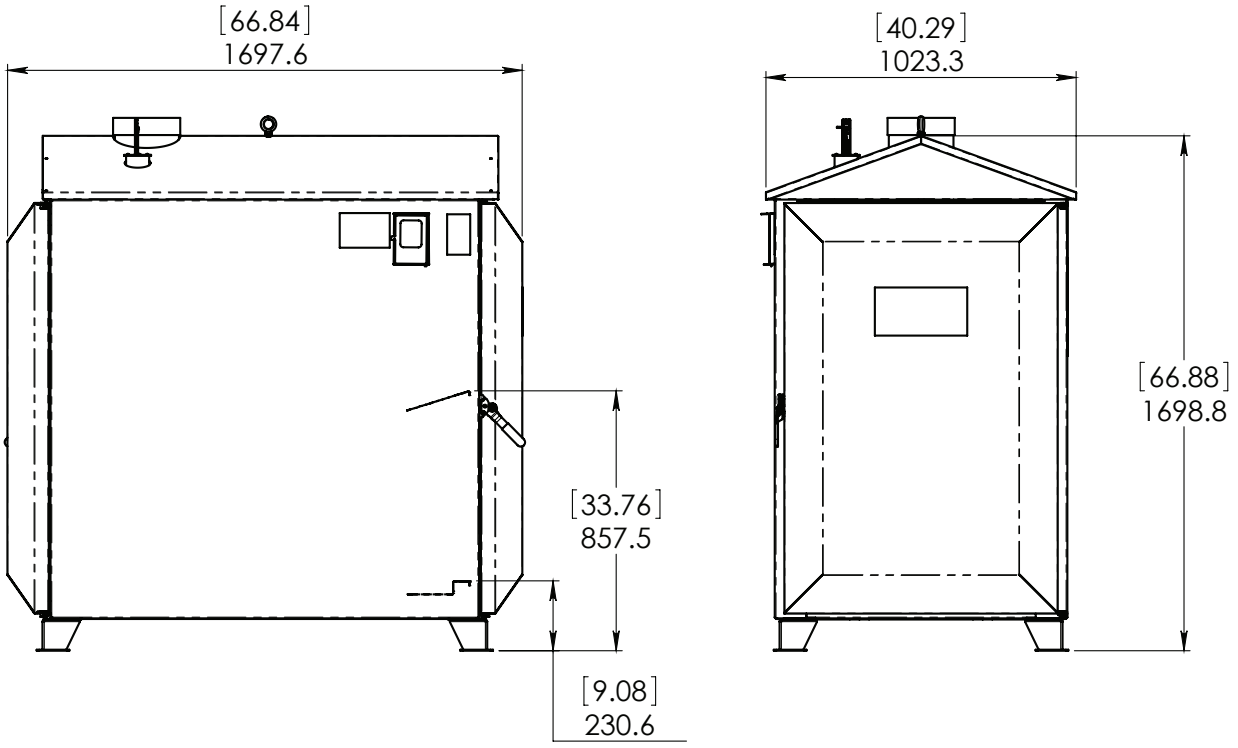
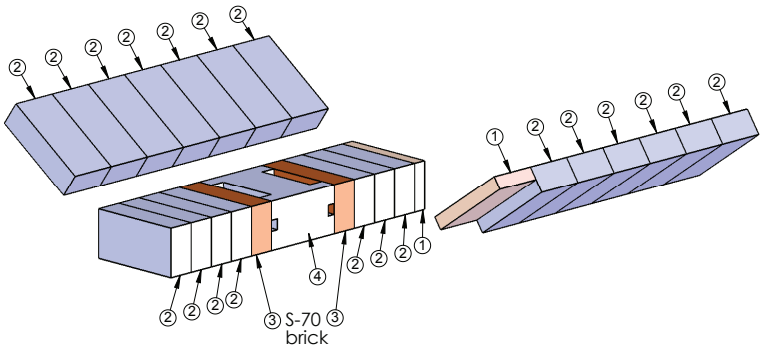
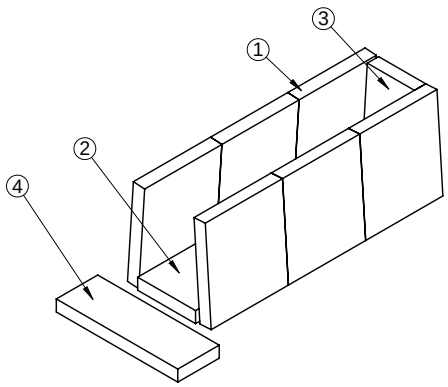


Figure 2 - Brick Layout



ITEM NO.	DESCRIPTION	QTY.
1	Brick, Fire	2
2	Brick, Fire, 2.5 in. x 4.5 in. x 9 in. Medium Duty	20
3	Brick, Fire, Alumina S-70, 2.5 in. x 4.5 in. x 9 in.	2
4	Manifold, Precast, Brick, Elite 200	1

Figure 3 - Refractory Layout



ITEM NO.	DESCRIPTION	QTY
1	Insulation, Fibre Board, Side, Burn Chamber	6
2	Insulation, Fibre Board, Bottom, Burn Chamber	2
3	Insulation, Fibre Board, End, Burn Chamber	1
4	Insulation, Fibre Board, Front, Burn Chamber	1

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Blower will not come on.	High limit switches may be shut off because the water temperature is higher than aqua-stat setting permits.	Wait for the water to cool down. Reset snap disc, see page 9.
	No electricity.	Check power supply.
	Blower overheated.	Wait for blower to cool down.
Blower is on but no air in firebox.	Flapper unit flap stuck shut.	For information on a sticking flapper see page 24.
The water overheated and boiled over. After refilling the water, temperature is below operating range, but there is no power coming through to the blower.	The high limit switch (snap disc) has tripped the circuit.	The high limit switch (snap disc) has a manual reset. Press button to reset. To locate snap disc see page 9.
There is some smoke coming from the chimney most of the time.	Wood is too dry or bridged.	Burn only seasoned wood. Reposition wood.
Furnace overheats and boils.	Main door has been left open.	Close door.
	Main door and/or ash clean out gaskets are leaking.	Replace gaskets or adjust latches and/or hinges.
Low heat output.	Wood moisture is too high causing the wood to bridge. Note: when bridging happens there is an air space between the wood and the firebox floor. The air then exits the firebox without causing the wood to burn.	Use seasoned wood. Cut wetter pieces 8 inches (20 cm) shorter than the firebox and load the logs centered in the firebox. Split the bigger logs. Place the logs carefully so they will not bridge.
	Fire has almost died out before refuelling.	Add wood before the fire has burned down.
	Wood is hung up and bridged because of incorrect length and loading.	Place logs centered over the brick slots/air passage on the firebox floor.
Low heat output.	The brick slots/air passage in the firebox floor is blocked by charcoal/ash.	Using the ash rake, always stir the firebox charcoal/ash into the lower ash chamber before adding wood. Limit the charcoal/ ash buildup and let the charcoal burn down before adding wood.
It is difficult to get a fire started.	Brick slots on the floor of the firebox are blocked.	Place small pieces of wood so air can flow through. Avoid flat pieces of wood that could block the air when laid flat on the firebox floor. As you add more wood place the wood so air can flow through.
Fire dies out with wood still left in the firebox.	The furnace has been on the off cycle for too long causing the wood to bridge or hang up. Flapper is stuck shut from the furnace idling too much.	In spring/fall when one load of wood lasts more than 16 hours do not fill up the firebox. To further avoid bridging, stack the wood so the lowest part of the stack is in the centre. In spring/fall use only 6 inch (15 cm) diam-eter and smaller seasoned logs.
	Not drawing enough heat from the furnace.	Increase the heat draw on the furnace.
Furnace water temperature is over 180°F (82°C) but no heat in the building.	Circulating pump is off due to one or more of the following: a bad connection, temperature is set too low, valves are closed, air is in the system or the water level is low.	Check for loose connections; open valves if closed; bleed air out of system; add water if level is too low.
Smoke coming from open loading door.	Cause could be one or more of the follow-ing: opening door too quickly, opening door soon after loading wood, furnace blower is off, loose wires, faulty switch/timer, too small or too short a chimney, negative pressure in furnace room.	Open slowly waiting 30 seconds after mov-ing lever to the left; do not open when fire is hot; switch blower on; move lever left and right, blower should be on in the load position; check limit switches/timer and wire connections; install longer and bigger chimney; increase venting to furnace room.

Empyre Elite XT

Model 100 and 200

10 YEAR LIMITED WARRANTY

Warranty service may only be performed by Pro-Fab Industries or a Pro-Fab Authorized Empyre Elite XT Furnace Dealer or a Pro-Fab Authorized Empyre Elite XT Furnace Service Centre.

PRO-FAB INDUSTRIES INC. WARRANTY

Pro-Fab Industries Inc. (hereinafter called "Pro-Fab") warrants to the original owner of the Empyre Elite XT Furnace (hereinafter called the "Empyre Elite XT") the following:

A two (2) year warranty on the workmanship of the furnace and workmanship on all parts manufactured by Pro-Fab, from the consumer date of purchase, and excluding normal wear items such as (but not limited to) the door gasket, fire brick, insulation, refractory, exterior finish.

A one (1) year warranty for any labour required for any repair or replacement of the furnace or parts from the consumer date of purchase based on Pro-Fab's predetermined labour rates and allowable hours.

A limited pro-rated warranty coverage (which includes the one (1) year labour coverage at Pro-Fab rates and hours as stated above) for a defective firebox and water jacket only, based on the following pro-rated scale from the consumer date of purchase:

- Years one (1) and two (2) – one hundred percent (100%) coverage;
- Years three (3), four (4) and five (5) – sixty percent (60%) coverage;
- Years six (6) and seven (7) – thirty percent (30%) coverage;
- Years eight (8) and nine (9) – fifteen percent (15%) coverage;
- Year ten (10) – ten percent (10%) coverage.

Absolutely no warranty is provided after ten (10) years from the consumer date of purchase.

Note: All parts NOT manufactured by Pro-Fab carry their own manufacturer's warranty. The owner is responsible for all related costs necessary to replace those parts, unless covered by the applicable manufacturer.

The above warranties are based on the following factors:

Pro-Fab reserves the right to repair or replace at its discretion any defective part or furnace, in whole or in part.

Use of Pro-Fab approved water treatment. IMPORTANT: Pro-Fab approved water treatment is available from your local dealer or service centre and must be used and validated for warranty coverage. The pH balance must remain between 8.8 and 11.0, the nitrite level must remain between 730 and 1460 ppm as $NaNO_2$, and conductivity must be less than or equal to 4000 mmhos. A copy of the invoice itemizing the purchase of approved water treatment will be required as proof of maintenance in the event of a warranty claim. All laboratory reports must be kept as proof of maintenance as indicated in the Installation and Operation Instruction Manual.

All instructions within the Installation and Operation Manual, as well as all local/provincial/state and national codes have been adhered to with respect to the chimney size and installation.

The water temperature has not dropped below 165°F (74°C) during operation.

All instructions within the Installation and Operation Manual, as well as all local/provincial/state and national codes have been adhered to with respect to the minimum clearance to combustibles and use of a non-combustible liner on a combustible floor for an indoor installation, per the guidelines within this manual.

All instructions in the Empyre Elite XT Installation and Operation Instruction Manual have been followed.

The Warranty Registration and a copy of the original bill (invoice) must be forwarded to Pro-Fab within thirty (30) days of the date of purchase to validate the warranty.

Pro-Fab will not be responsible or liable for any of the following: a) If warranty work requires removal or replacement of all or a part of the furnace, Pro-Fab is not responsible for the cost of plumbing, freight, permits, removal or disposal of damaged furnace or parts, replacement of water or additives, labour after the one (1) year warranty coverage expires, or any cost other than the warrantied replacement part itself or the furnace; b) The care, maintenance and safe operation of the Empyre Elite XT Furnace which is the responsibility of the owner of the furnace; c) Any accidents, injury, damage or loss incurred due to a heating system failure; d) Any accidents, injury, damage or loss incurred due to faulty installation, operation or maintenance; e) Any cost incurred for replacing or repairing of parts not manufactured by Pro-Fab which carry their own manufacturer's warranty; f) Any out-of-pocket expenses, alternative accommodations or loss of revenue due to defective parts or furnace; g) Performance problems caused by improper sizing of the furnace, vent connection, or air openings; h) Damages, malfunctions or failures resulting from the use of any attachment not authorized by Pro-Fab; i) Units installed outside the continental United States, Alaska, or Canada without prior approval from Pro-Fab; j) Units with their safety certification labels removed; or k) Damages, malfunctions or failures caused by force majeure, abuse, accident, fire, or acts of God.

Any available warranty will be void if: a) Maintenance procedures are not followed as indicated in the Installation and Operation Instruction Manual; b) Water treatment and proper additives are not used as specified in the Installation and Operation Instruction Manual; c) The Empyre Elite XT Furnace has been altered in any way; d) Any material other than Pro-Fab approved fuel has been used; e) Any instruction given in the Installation and Operation Instruction Manual which has not been followed including during installation or regular maintenance; or f) Any claim made under the warranty for a person other than the original owner.

There are no other warranties, expressed or implied, by Pro-Fab or its Authorized Empyre Elite XT Furnace Dealers or Authorized Empyre Elite XT Furnace Service Centres regarding the Empyre Elite XT Furnace except the warranty expressed herein. ANY IMPLIED WARRANTIES, INCLUDING MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE, SHALL NOT EXTEND BEYOND THE APPLICABLE WARRANTY PERIODS SPECIFIED ABOVE. PRO-FAB'S SOLE LIABILITY, WITH RESPECT TO ANY DEFECT, SHALL BE AS SET FORTH IN THIS LIMITED WARRANTY, AND ANY CLAIMS FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES ARE EXCLUDED.

No person is authorized to bind Pro-Fab to any other warranty whatsoever. Pro-Fab reserves the right at any time to make changes or improvements to the design, materials or specifications of the Empyre Elite XT line of furnaces or parts without thereby becoming liable to make similar changes in the furnaces or any of its parts previously manufactured.

Manufactured by:
Pro-Fab Industries Inc.
Box 112, Arborg, MB R0C 0A0

PRO-FAB INDUSTRIES INC.

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